Living Labs Catalogue

Version 1, October 2017

LOW CARBON LIVING CRC

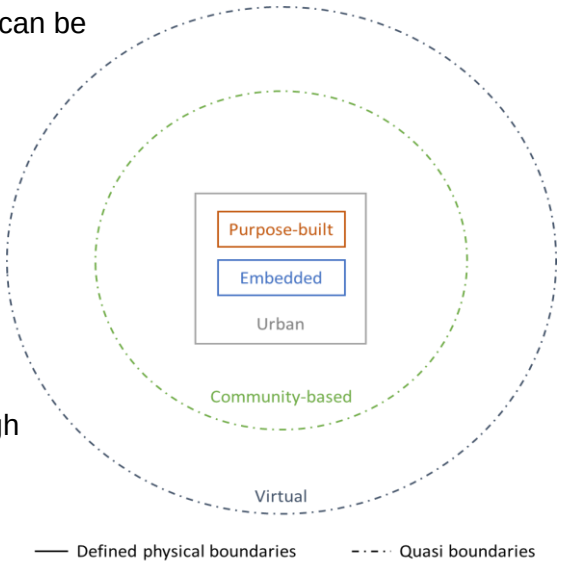
Living Labs

We have established 15 Living Labs which are detailed in this catalogue.

Living Labs are real-life environments that promote innovation in services or technology by facilitating co-creation between multiple stakeholders including business, academia, government and end users. They function as innovation accelerators, where new ideas emerge, are prototyped and tested in collaboration with users in real-life settings.

Our Living Labs are categorised according to a typology of five categories (Fig 1):

Embedded:	Based in existing places, where users can be observed interacting with existing technologies or prototypes
Urban:	Similar to embedded but at a larger scale
Purpose built:	Specifically built to become a place for prototyping and testing new materials and technologies
Community based:	Established for social innovation; may not possess a physical boundary
Virtual:	Activities are conducted entirely through virtual platforms



Eon & Morrison 2017

Our Living Labs are distributed throughout Australia (Fig 2).

The CRC for Low Carbon Living

We are an end user driven national research and innovation hub whose core purpose is to transform the built environment to a low carbon future. Our mission is providing industry and government with collaborative research which captures community imagination and creates opportunities for low carbon technologies, materials, design and planning innovations. These social and technology solutions, and policy evidence will facilitate the transition to a low carbon built environment.

Contact us

To find out more about any of our research, please contact us:

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#	Title	Location	Objectives	Outcomes / progress	Embedded	Urban	Purpose built	Community-based	Virtual
RP1010	CSR House – The energy, thermal and economic performance of an 8-star energy efficient home	Schofields, outer western suburbs of Sydney, NSW	• Monitor and model the energy and thermal performance of the CSR House, which is a purpose-built residential living lab rating 8 stars under the NatHERS scheme • Investigate the costs associated with improved technical performance of homes	• Lessons learnt during the design, construction and operation of the house, which is equipped with 140 data collection points, is being used to inform new housing developments. • Designed and built by building products company CSR, it incorporates 44 of their proprietary products and has a 45% lower heating and cooling load than a minimum 6-star NatHERS home.	X		X		
RP2018	Broadway – Retrofitting urban precincts to create low carbon communities	Sydney CBD, NSW	• Identify pathways to transition existing urban communities to low carbon energy and water using precincts • Empower stakeholders within communities to drive transitions to low carbon energy and water use, by providing them with the data and processes they need for change. • Act at a precinct scale and incorporate the University of Sydney, Sydney Institute of TAFE, Frasers Broadway and One Central Park as living laboratories as well as Brookfield Multiplex, Flow Systems, City of Sydney, AECOM and Better Building Partnership. Link: http://www.empoweringbroadway.com.au/	• Broadway's research assists stakeholders better understand existing precincts, create business cases and implement technologies and governance models required to transition to low carbon community • The project is providing an improved understanding that assists precinct stakeholders to create successful low carbon infrastructure. Phase 1 of the project has identified a number of governance features, business models, technologies and global case studies. The various stakeholders are examining how to implement this within Broadway		X			
RP3009	High performance homes	Fremantle, Perth, WA	• Measure and assess resource consumption and energy and water efficiency of ten Western Australian homes with above-standard energy and water efficiency, but varying in design and occupancy • Establish a baseline period and then introduce residents to a behavioural change program with results collected and analysed	• The high performance houses used less energy per square metre, but performance among them varied significantly because of differences in PV performance, people's practices and home maintenance • Results highlighted the need for houses to be viewed as a system of practice; incorporating both occupants and their everyday behaviours and actions	X				
RP3009	Josh's House – a high performance home	Hilton, Perth, WA	• Assess whether high performance, zero emissions homes are accessible to the volume market • Demonstrate and share learnings from constructing and maintaining these homes with industry and the broader community	• Josh's House was completed in 2013 to a 10-star NatHERS energy efficiency rating standard • The house includes detailed monitoring of 70 individual channels of data logging which is used to assess the	X		X		

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			Link: http://joshshouse.com.au/	performance of the various design features and technologies in place • The house and website, which attracts considerable media attention, are popular resources for those looking to build their own low carbon home					
RP3010	Blue Mountains – Reducing the carbon footprint of tourism industries	Upper Blue Mountains, NSW	• Assist tourism businesses (whose industry accounts for five per cent of Australia's greenhouse gas emissions) reduce their overall carbon footprint Link: https://www.lowcarbonliving-bluemountains.com.au/	• 30 businesses involved in the pilot have been audited for their energy, water and waste use, advised how to be more efficient in using carbon based resources, assessed on what they've done so far and had their carbon reductions calculated • Businesses have been awarded gold, silver or bronze ratings to indicate their achievements. Some have achieved up to 15% reductions in one year • A website providing resources on how residents and visitors can reduce emissions has been established				X	
RP3011	Yarra Livewell – Developing social norms for low carbon behaviour	Inner northern suburbs of Melbourne, within the Yarra municipality, VIC	• Assist community members to work together to reduce their carbon emissions • Facilitate group workshops to provide information and collect community feedback about ways people can reduce home energy use and waste, divest from high carbon investments, recycle more and have conversations about climate change. Link: https://livewell.net.au/	• Participants learned new ways to live low carbon lifestyles, receiving advice on ○ draft-proofing ○ retrofitting homes ○ switching to energy efficient lights ○ starting food gardens ○ switching to lower carbon modes of transport ○ installing solar panels ○ green power ○ sharing resources with neighbours ○ calculating a carbon footprint					
RP3017	Adelaide Living Laboratory Hub	Tonsley, Bowden and Lochiel Park in Adelaide, SA	• Develop an action based research project drawing evidence from three key Adelaide development sites at Tonsley, Lochiel Park and Bowden • Develop Lochiel Park, a 15 hectare Green Village, including 10ha of open space, forest, wetlands and energy efficient homes for 150 people	• Lochiel Park has helped residents reduce greenhouse gas emissions, create social capital and foster a sense of community • It's anticipated by 2027 Tonsley Innovation Hub will have 1110,000m^2 of commercial land use and 130,000m^2 of high-value manufacturing activity • Bowden Village aims to create a walkable community for 3,500 residents, with 15% affordable homes, and a place		X			

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			• Bring together entrepreneurs, researchers and incubators at Tonsley Innovation hub to work in conjunction on projects that drive productivity, innovation and technology. • Develop Bowden Village as a high density, walkable community within a 16 hectare parcel of urban infill	for 32,000m^2 of commercial space, retail, alternative energy and community green space					
RP3020	Improving the carbon footprint of schools	Various schools in Perth, WA	• Assist schools lead in low carbon transitions. • Develop, implement and track a community-led low carbon program to maximise their operational efficiency and achieve carbon neutrality. • Assist schools reduce utility bills and greenhouse gas emissions, as well as improve the health, comfort and wellbeing of students and teachers. Link: http://simplycarbon.com.au/climateclever-initiative-2018/	• Reduction of emissions generated by the 15 schools from a 2015 base year = ~3,770tCO_2-e • Of the >590 low carbon actions identified by the schools, as at late 2017, more than 200 have been implemented • Greater reductions are expected by the end of 2017				X	
RP3033	White Gum Valley – Facilitating uptake of low carbon homes in new precinct developments	White Gum Valley, Perth, WA	• Follow the development process from construction through to occupancy of White Gum Valley (WGV), a 2.2 hectare medium density, 80 dwelling infill development. • Function as a precinct-scale project involving diverse building typologies, climate sensitive considerations, as well as urban greening and water management strategies.	• Research involves monitoring different dwelling types to assess design performance, as well as the impact of technology choice and occupant behaviour on energy use and carbon emissions. • The project is also exploring the inter-relationship between developers, local government, builders and home buyers to determine low carbon aspirations and outcomes, as well as how these can better align. • It is expected there will be a 60 per cent reduction in typical operational greenhouse gas emissions across WGV's various dwelling types, due to a suite of relatively affordable initiatives.		X			
RP3043	Beyond White Gum Valley – Community battery storage	Fremantle, Perth, WA	• Build on previous examples of battery storage integration and various commercial and governance models researched as part of previous CRCLC projects	The project is developing and implementing a large, community-size battery storage project in a new housing development in the City of Fremantle		X			

	Greater Curtin	Bentley, Perth, WA	• Turn the 114 hectare campus of Curtin University of Technology, into a city of innovation
			• Deliver on four key network strengths:
			  ○ an epicenter of research and innovation
			  ○ a creative capital, an important visitor destination
				As this precinct scale living lab develops, the outcomes will be visible and accessible to all stakeholders		X			

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			○ an urban economy ○ a hub for businesses and community groups						
	Swinburne Innovation Precinct	Hawthorn, Melbourne, VIC	• Bring together entrepreneurs and researchers to collaborate, solve problems, and scale up commercial technology and services • Unite the Design Factory Melbourne, the Factory of the Future, and the Digital Innovation Hub • The precinct aims to be a model for boosting Australia's lagging innovation output, in part by incorporating a culture of innovation throughout the university campus • A business incubator will to support at least 10 to 15 start ups each year. Link: http://www.swinburne.edu.au/innovation-precinct/	To date, there has been collaboration with the Italian Polytechnic University of Turin's Innovation Enterprise and Business Incubator and CSIRO		X			
	Factory of the Future – Swinburne	Hawthorn, Melbourne, VIC	• Provide industry, students and organisations with state-of-the-art facilities to explore conceptual ideas for manufacturing next generation products • Equip users with advanced visualization and design tools, immersive virtual reality environments and prototyping facilities Link: http://www.swinburne.edu.au/research/strengths-achievements/strategic-initiatives/factory-of-the-future/	• The facility has contributed to industry-based learning, while promoting partnerships between industry and researchers. • The factory assists the university develop new products, new methods of manufacturing and contribute to more productive, sustainable businesses.			X		
	Illawarra Flame House	Wollongong, NSW	• Demonstrate how to retrofit an existing home into a solar-powered, cost-effective, energy efficient one Link: http://www.illawarraflame.com.au/	• Illawarra Flame House was built by members of the University of Wollongong and TAFE Illawarra Institute as part of their entry into the 2013 Solar Decathlon. They won first place for their design which retrofitted an existing fibro home. • Today the house is on public display and can be rented as short-term accommodation. • The home is inspiring Australians to embrace sustainable retrofitting technologies in their own homes			X		
	Sustainable Buildings Research Centre –	Wollongong, NSW	• Build an energy efficient building that doubles as a host space for research and industry collaboration aimed at making buildings sustainable	• The SBRC has achieved a 6-star green star education design v1 accreditation, which represents world			X		

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	University of Wollongong		• Bring together researchers, students, and industry to develop, prototype, and test sustainable building technologies and designs, carry out experiments, develop architectural and structural design tools to encourage mindfulness of low carbon solutions throughout a project's development, and investigate day-to-day behaviour of building occupants. Link: https://sbrc.uow.edu.au/index.html	leadership in environmentally sustainable design practices. • The centre has served as a hub to assist in the rapid decarbonisation of Australia's built environment and places a major focus on retrofitting existing buildings					