

Sanctuary

MODERN GREEN HOMES

ISSUE
65

Cool design for hot climates; tips for FireWise gardens;
Australia's best bushfire zone builds; Accoya eco-timber

Tropical delights



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WIN

A Stiebel Eltron hot water
heat pump valued at \$6,250,
provided by Goodbye Gas.

Offer open to Australian residents. Details page 85

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PRODUCTS

These eight featured products are independently selected by our editorial team. If you have recommendations for products you think would be of interest we'd love to hear from you. Email: sanctuary@renew.org.au



1 Easy greywater reuse

Heading into what's likely to be a dry summer, water efficiency is back on the agenda. The EZGREY greywater diversion system filters and pumps laundry, shower and basin water into garden irrigation systems. The system's compact, user-friendly design allows for installation above or below ground, and a diversion valve sends water to the sewer when the system isn't in use. Available through Water Wally, it can be paired with a Grey Flow dripline kit to distribute water efficiently around your garden.

waterwally.com.au



2 A perfect fit

It can be hard to find blinds that work well with operable windows and hinged doors, especially tilt-and-turn style windows. Louvolite's Perfect Fit range may do the trick: available in various styles including energy-efficient cellular, the blinds fit neatly into a frame that is attached to and moves together with the window or door as it's opened. No drilling or screws are needed for installation, preserving frame integrity. Images: Louvolite Australia

louvolite.com.au

3 ThinTanks go mini

We've reviewed the super-slim rainwater storage solutions from ThinTanks before, but it's worth mentioning that their range now includes a diminutive 500L tank that's designed to fit into even more difficult spaces. At just 1,200mm high and 1,200mm wide, the tank can sit under a windowsill or form a low garden divider, and several can be joined together to increase capacity. Like larger ThinTanks, the 500L tank can be transformed into a vertical garden with ThinPots that clip directly onto an irrigation pipe for watering.

thintanks.com.au



REVIEWS

If you have recommendations for films, books, smartphone apps, podcasts, websites or anything else, email: sanctuary@renew.org.au

BOOKS



Design emergency: Building a better future

Alice Rawsthorn &
Paola Antonelli

Phaidon Press, 2022

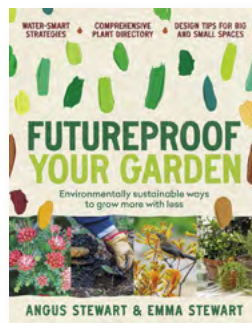
\$50

“We are at a crossroads, where we urgently need our lives to be radically redesigned and reconstructed after the grief and turmoil of the Covid-19 pandemic,” write well-regarded art and design critics and researchers Alice Rawsthorn and Paola Antonelli in the introduction to *Design emergency*. What follows is a fascinating and absorbing read, in the form of interviews with designers, engineers, scientists, economists, architects, artists and others who all have their own relationship with design and who are delivering the kind of innovations needed to secure humanity’s future.

To set the scene, Alice contributes a history of design emergencies, followed by Paola’s review of design in the time of Covid-19: jarringly recent and resonant! The rest of the book presents the innovators’ stories, loosely grouped into chapters covering technology, society, communication and ecology. There are plenty of contributions on the built environment: Fritz Haeg describes the challenges not only of rebuilding the infrastructure but also of designing a new way of life at the revived Salmon Creek Farm commune in California; self-described “vagabond architect” Vinu Daniel talks about his practice utilising ultra-local and waste materials for sustainable construction in India; and British architect Peter Barber introduces his shoestring-budget social housing projects on “scrappy sites” in and around London. But we also hear from people working on telemedicine, the design of refugee camps, reconnecting with nature, artificial intelligence, and even space travel. One particularly inspiring project is the Great Green Wall of Africa, which aims to restore the land by planting 8,000 kilometres of vegetation from one coast of the continent to the other.

Despite its somewhat alarming main title, this beautifully designed (of course) book is in fact an informative and hopeful read for anyone interested in design in all its facets, and how design thinking can help to save the world.

Review by Anna Cumming



Futureproof your garden

Angus Stewart &
Emma Stewart

Murdoch Books, 2022

\$45

Subtitled *Environmentally sustainable ways to grow more with less*, this book is a great resource for people looking to create and maintain a water-efficient garden, at any scale from rural acreage to a suburban courtyard. Horticulturalist father-and-daughter team Angus and Emma Stewart lay out the way water moves across the landscape and identify and explain practical ways to redirect, capture, store and use it efficiently in times of drought or deluge.

There are detailed how-to sections on rainwater tanks, planting beds, dams and drains. Emma and Angus explain the pros and cons of different methods of irrigation, including low-effort self-sustaining systems for the time-poor gardener. There is also a comprehensive section on soil health: composition, moisture, mulch, composting, nutrition and so on. The chapter on planting techniques provides transplanting advice and covers ways to make commercial nursery-raised plants more likely to adapt to environments with low or variable water availability.

The plant guide at the back is a great resource for learning about the optimal growing environments for both native and non-native species, with detailed information about temperature and water requirements. It also lists the fauna that particular plants attract, and outlines water-smart planting options for both rural and urban settings.

The book is an easy read, packed with lots of information, and would be a great reference for people looking to implement water management and soil enhancing techniques in their garden.

Review by Liz Lee

HOUSE PROFILE
Wooragee, VIC

WORDS
Rebecca Krispin

PHOTOGRAPHY
Jeremy Weihrauch

AT A GLANCE

- *100m² family home orientated for passive solar performance*
- *Off-grid house with no gas use*
- *Sustainable and locally sourced materials*

Mini homestead



In a small off-grid home in rural Victoria, built to a simple floor plan using local materials, this family lives closely connected with each other and their beautiful surrounds.

Home base



AT A GLANCE

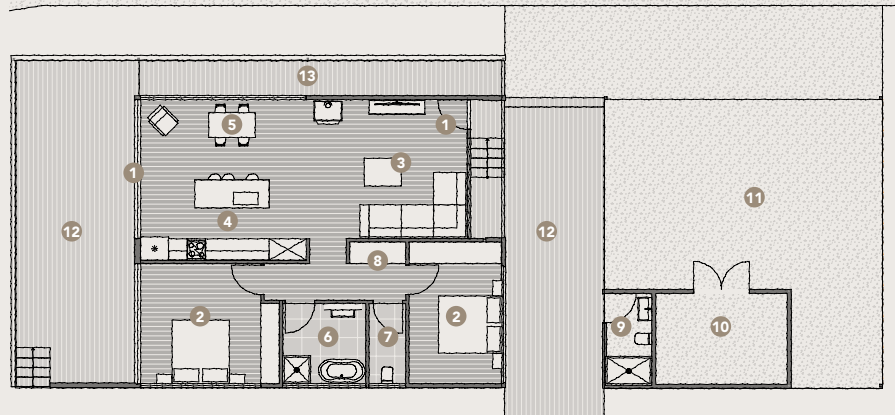
- *Bucking the 'big and flashy' trend never looked so good!*
- *Modest owner-built home for retirement*
- *Easy-care and accessible for lending and leasing out*
- *Materials and detailing kept simple for reduced maintenance and to keep costs down*



FLOOR PLAN

LEGEND

- 1 Entry
- 2 Bedroom
- 3 Living
- 4 Kitchen
- 5 Dining
- 6 Bathroom
- 7 Toilet
- 8 Laundry
- 9 External bathroom
- 10 Store
- 11 Carport
- 12 Deck
- 13 Ramp



SPECIFICATIONS

DESIGNER

Matt Thitchener

BUILDER

Owner-builder

PROJECT TYPE

New build

LOCATION

Killcare, NSW
(Darkinjung Country)

COST

\$400,000

SIZE

House 100m²
Decks and ramp 93m²
Workshop & outdoor
bathroom 18m²
Land 621m²

BUSHFIRE ATTACK LEVEL

BAL-12.5

HOT WATER

– Rinnai 335L electric-boosted solar thermal

WATER SAVING

– Duraplas 2,000L water tank for garden use

PASSIVE DESIGN, HEATING & COOLING

- Lightweight construction on screw piles
- Small footprint, passive solar design and well-insulated building envelope for thermal performance despite low thermal mass
- 1.3m eave overhang to north provides weather protection to ramp and correct sun control to living space for summer and winter
- 3.9m eave overhang to west protects the deck and shades west-facing glazing
- Adjustable cross ventilation

ACTIVE HEATING & COOLING

- Ceiling fans: Eglo Noosa 52" to living area and front deck, Mercator Eagle XL to bedrooms
- Lopi Answer slow combustion wood heater
- Energy-efficient Mercator heat lamp and fan to bathroom

BUILDING MATERIALS

- Timber frame construction with Zinalume and fibre cement sheet cladding and Colorbond Klip-Lok roof
- Floor: 10mm ply with 3mm oak finish, from Ettalong Carpet and Flooring
- 5" galvanised steel screw pile foundations
- Insulation: CSR Glasswool batts to ceiling (R6) and all walls (R2.7), Bradford Polymax batts under floor (R4)
- Blackbutt decking

WINDOWS & GLAZING

- Improved aluminium-framed windows and doors in a commercial profile with 6mm toughened glass and Pilkington Eclipse Advantage film from MidCoast Windows
- Louvres in all rooms for cross ventilation
- Aluminium louvres to second bedroom for dark daytime sleeping

LIGHTING

- LED downlights throughout, rated for installation under insulation

COOKING

- Sirius Valentia 90cm induction cooktop with integrated downdraft extraction

PAINTS, FINISHES & FLOOR COVERINGS

- Dulux interior paint
- Icelandic cowhide rug to living room and woven jute rugs and runners in bedrooms and hallways to absorb sound

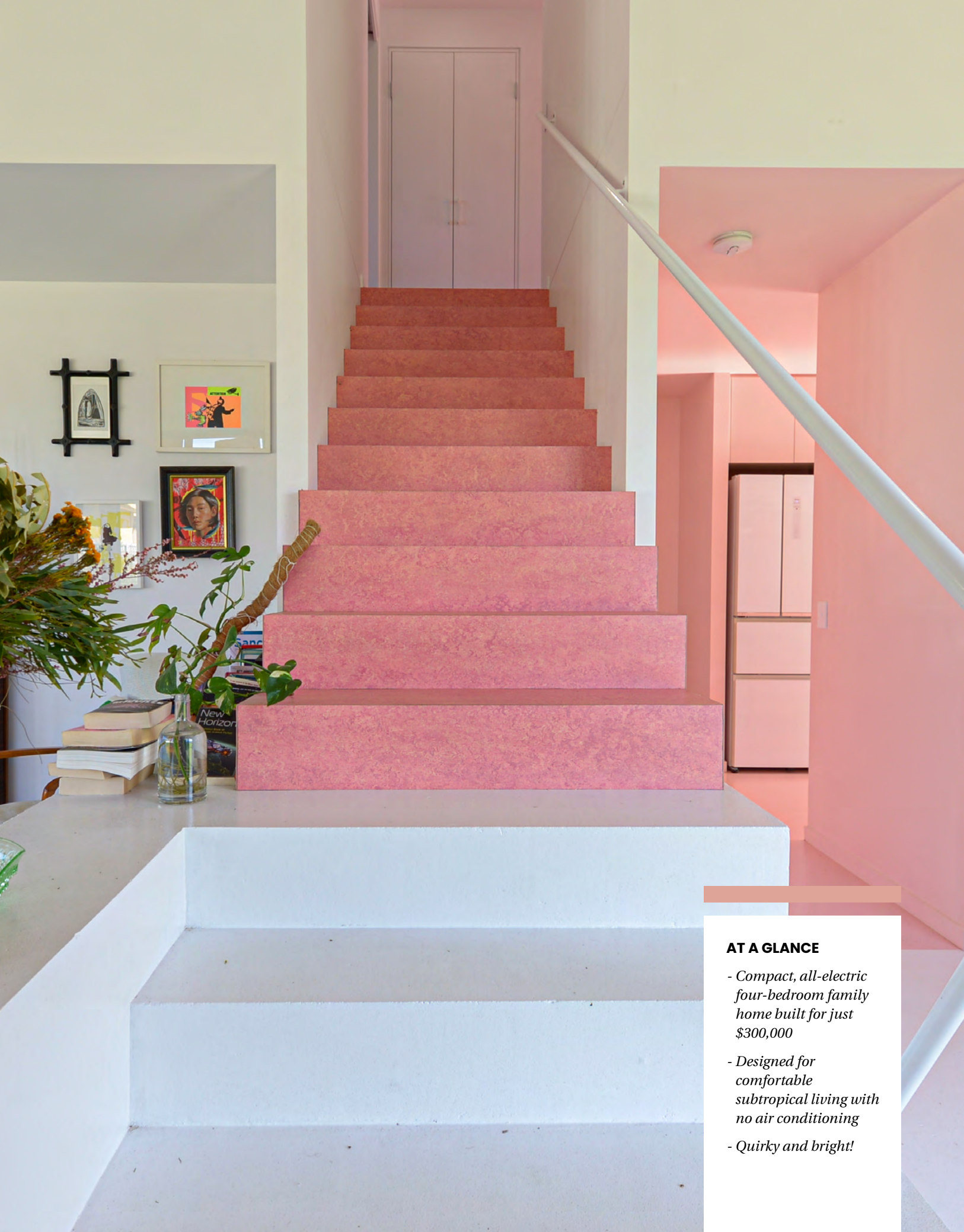
OTHER ESD FEATURES

- No gas to house; all appliances chosen for energy efficiency
- Universal design elements for accessibility and ageing in place:
 - Ramp access and sill-free entry doors
 - Wide doorways to all rooms
 - Bathroom and toilet have pedestal basins to accommodate wheelchairs and walkers
- Repurposed antique furniture and fixtures from Stone Pony Furniture
- Garden includes beehive and citrus trees; food-producing gardens underway

Pretty **in pink**

Cool pink and white inside and out, this subtropical home challenges the status quo – and not just with its colour scheme.





AT A GLANCE

- Compact, all-electric four-bedroom family home built for just \$300,000
- Designed for comfortable subtropical living with no air conditioning
- Quirky and bright!



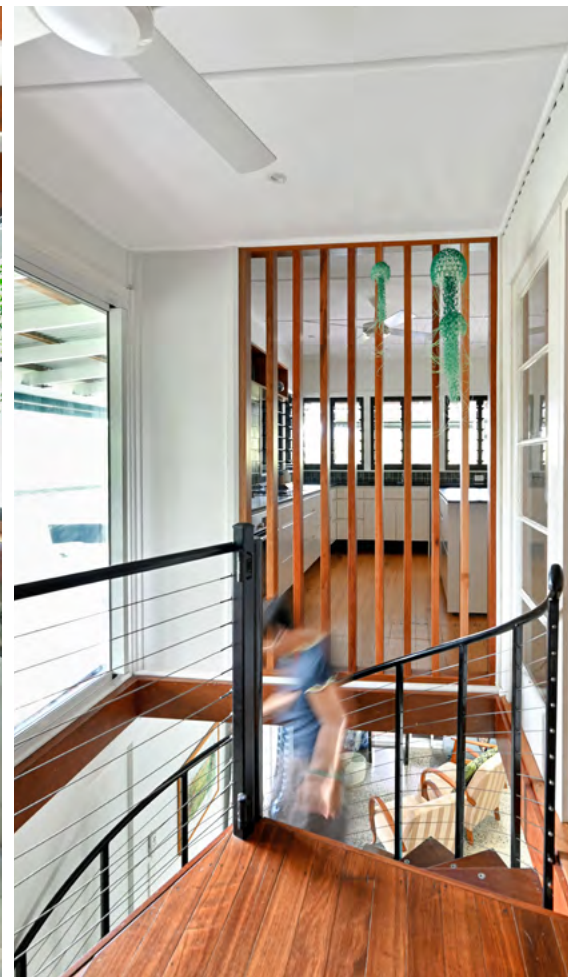
Airy flair



AT A GLANCE

- Simple layout changes to existing family home for increased liveability
- Focus on ventilation for comfortable tropical living
- Gas use abolished and 6.48kW solar PV system installed

A minimalist renovation to their 1970s Queenslander unlocked natural ventilation, energy efficiency and more useable space for this Cairns family.



Joanna and Shawn bought their weatherboard Queenslander on a large sloping block in suburban Cairns in 2009, soon after they married. They were looking for a home big enough to start a family, and fell in love with its 1970s style, lush landscaped gardens, hillside location and views to the city.

The house had undergone several renovations by different owners over the years. These included enclosing the original west-facing verandah to form a sunken lounge and sleep-out, and building in the area under the elevated main level for an additional bedroom, bathroom and living area. The layout suited the family while their children

were small, but they started to feel its constraints as the kids grew.

“Our house was big enough – we didn’t need to extend,” says Joanna. “But the kitchen needed remodelling, the varnish was coming off the floors, and we wanted to update the main bathroom at the same time. We also wanted to revamp the poky third bedroom upstairs into a more appealing private space for our teenaged eldest daughter.” In addition, they planned to improve the liveability of the house with changes suited to their tropical climate, and bring it up to date with the latest cyclone resilience requirements.

The couple were referred to local Cairns architect Nancy Lau, and

Above left Shawn and Joanna love the 1970s style of their home, and made material and colour choices for their renovation to preserve the character as much as possible. In the sunken living room, open shelving delineates a new music and study area. **Above right** An open screen between the kitchen and spiral stair is an important strategy for better cross and stack ventilation.

Below Designed by Nielsen Jenkins, the Mt Coot-tha House in Brisbane addresses the BAL-40 rating of its sloped, treed site by making use of robust non-combustible building materials. Image: Tom Ross

BEYOND BAL | The hunt for true resilience

As part of ongoing work to support communities rebuilding after bushfire, Renew is showcasing homes that demonstrate resilient design and building practices that go beyond simply meeting legislated bushfire building requirements.

Back in 2020, Renew developed the Green Rebuild Toolkit in response to the mega-fires that had swept across large areas of Australia the previous summer, in order to help people rebuild their homes and increase resilience in the face of future climate disasters. This year, with extreme summers back on the weather radar, the Toolkit has been expanded to include 12 case studies of bushfire-resilient homes around the country.

These homes are the pick of the bunch identified as part of our Beyond BAL project. We searched for the most fire-resilient buildings in Australia, with a view to extending our understanding of best practice beyond the somewhat complicated and variable Bushfire Attack Level (BAL) rating system, which is written into national and state building regulations but tends to be applied inconsistently.

Renew invited architects, designers and homeowners to submit designs, and worked with bushfire design experts Dr Douglas Brown from Bushfire Architecture and Nigel Bell from ECODesign Architects to assess the submissions based on three criteria: affordability, environmental sustainability and bushfire resilience. “The intent was to seek out innovative homes and share the best of them for all to learn from,” says Nigel.

The Beyond BAL project found differences between states

and territories in the application and stringency of bushfire building requirements. The accepted level of training and expertise amongst bushfire assessors varies. In addition, the starting point for assessment, the Fire Danger Index (FDI), is based on past fire history rather than projections taking climate change into account, and is artificially low in some states. Hence, BAL assessments are not uniform across the country. However, as an indication of what’s likely to develop, Tasmania and the ACT are now prohibiting new houses being built on sites assessed as higher risk than BAL-29.

People building in bushfire-prone areas are often doing so because they value the lifestyle of living among the gum trees, and are willing to take on some increased risk of bushfire loss rather than clearing vegetation. This typically puts their sites into high or extreme BALs (BAL-40 to BAL-FZ) where the risk is from burning embers, radiant heat and direct flame contact, as well as extreme winds and smoke. All the Beyond BAL submissions grappled in some way with these issues: balancing retaining the natural bushland ecology (with its associated risk to property and even life) with creating a safer building (and associated elevated building costs). Some projects included extensive land clearing, while other homeowners chose to retain



the bushland. Most accepted a regulatory compromise. What is clear from Beyond BAL is that there is no single, simple way to address the requirements of the infinitely varied building sites across the nation; a regulatory response to appropriate asset protection zones is complicated.

As our climate heats and bushfire risk increases, insurance becomes unaffordable or unavailable, and bushfire building requirements become more stringent, it will become more expensive and more difficult to meet national, state and local regulations. One intent of the Beyond BAL project was to find and showcase lower-budget homes that still meet these challenges. “As a result, some beautiful homes set on steep slopes within eucalypt forest were not shortlisted because of their very high build costs, although they otherwise had a lot to recommend them,” explains Nigel. Many of the projects selected for case studies are small houses with simple yet striking designs and robust, readily available materials, which may need to be the way forward in bushfire-prone areas.

All 12 case studies will be available on the Green Rebuild Toolkit website at greenrebuildtoolkit.com; read on for a taster of three of our favourites.

THE THREE MAIN CRITERIA FOR BEYOND BAL PROJECTS:

- **Bushfire resilience:** considering enormous variations across ecologies and sites.
- **Environmental sustainability:** such as energy efficiency and materials used, essential in mitigating further extreme climate events.
- **Affordability:** noting that meeting the regulatory requirements for high BAL-rated sites invariably adds complexity and cost to building or renovating.

BROAD BUSHFIRE RESILIENCE CRITERIA FOR ASSESSING SUBMISSIONS:

- Defendable siting
- Landscape setting
- Water supplies
- Building design
- External construction materials
- Windows and doors
- Verandahs and decks
- Innovation



IN PRAISE OF ACCOYA

Above Curved glulam beams and battens, crafted from Accoya by Curwood, were used to great effect for a series of play pods at a Sydney children's playground. Image: Steve Brown Photography

Facing page Accoya makes attractive cladding for this Perth house by Coast Homes. Image: Joel Barbitta, D-Max Photography

Eco-friendly, long-life modified wood

Native hardwoods are beautiful, strong and durable, but we need to wean ourselves off destructive forestry practices. Building designer and recreational woodworker Dick Clarke takes one hardwood alternative for a test run.

The world has used and loved Australian native hardwoods for over 200 years, with such faraway structures as the London docks benefitting from the material's longevity in arduous conditions. However, as a result of sustained logging, land clearing, bushfire and now climate change, our forests are in a bad way and our koalas and other fauna have a less than ideal run at life.

Partly as a result of the devastating 2019-2020 Black Summer bushfires, most states have recently restricted or stopped altogether the logging of old-growth



SHACK SHAKEUP

THE BRIEF

- Retain and renovate original shack for better thermal performance without destroying its character
- Extension to give space for a fabulous new kitchen, dining area and laundry
- Established garden and views to the west must be maintained

Lillian and David are planning to move permanently to their beloved beach shack at Jam Jerrup, on Victoria's Westernport Bay, but first it needs an overhaul for thermal comfort and more living space. Designer James Goodlet of Altereco Design is familiar with Victorian coastal climate conditions, and offered some advice to the couple.

DESIGNERS IN PROFILE



CLAIRE McCAUGHAN

Architect

Custom Mad

custommad.com

Works in Sydney & regional NSW

What kind of house did you grow up in?

I grew up in a Californian bungalow, a beautiful family home with an established garden made by my mum. It was close to the Hacking River in southern Sydney, so I'm really connected to the river and ocean.

What was the first design project you were really proud of?

A frequent challenge for our practice is how to make the 100+-year-old houses we work on fit for modern living, while using as little extra material as possible. Our recent project Jude's Place is a great example of reconfiguring the internal layout of a house to make more bedrooms for a growing family while adding only 13 square metres to the footprint. We reused roof tiles and bricks, and only needed a small amount of timber framing for the new area. I'm proud that as a practice we're really focusing on sufficiency in the way we use materials and design, so that we create as little waste as possible.

What is your favourite sustainable building and why?

Charles Rennie Mackintosh designed Hill House outside Glasgow in 1902, and it's the most wonderful example of art nouveau design. However, over a hundred years later the external render of the house had deteriorated to the point of affecting the interiors with water damage. In 2019, architecture studio Carmody Groarke completed the Hill House Box, which is an elegant hood for the building that protects the render from further damage. The box is a temporary solution while heritage experts decide how to repair the building. It's a beautiful act of care and restoration, which is perhaps where sustainable design should always start.

What's on your drawing board right now?

We've just started working on a heritage-listed 100-year-old house on the Hacking River in Lilli Pilli, Sydney. A rare example of an early 20th century vernacular cottage, it sits on a sandstone headland surrounded by bush and overlooking the Royal National Park. Our job is to bring this beautiful lady back to life and add a bedroom wing.

If you weren't an architect, what would you be?

I wouldn't be anything – I'd just garden and swim all day! But if I had to pay the bills, I'd be a florist.

What's something you think all homes should have?

I think all houses should have the ability to make electricity, store water and grow food. When it comes to responsible architecture, we must commit to making space for vegie gardens, rainwater tanks and solar PV panels. If all houses had these three simple items, we'd take so much pressure off our precious resources.



WIN

a Stiebel Eltron hot water heat pump valued at

\$6,250

provided by Goodbye Gas in partnership with Stiebel Eltron

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