

# Sanctuary

MODERN GREEN HOMES

ISSUE  
49

Sustainable building dos and don'ts; ceiling fans;  
allergy-friendly Passive House; vegies by subscription

## Backyard builds

Studios, small homes  
& inspired infill

**WIN**

A Sanden Eco  
Plus hot water  
heat pump  
valued up to  
\$5,000

Offer open to  
Australian residents.  
Details page 43

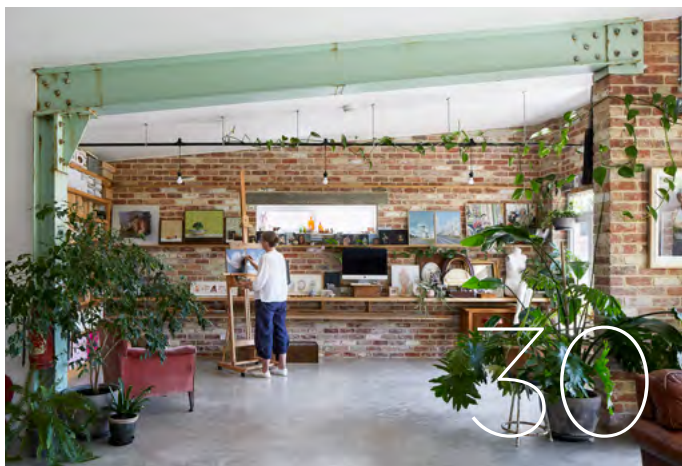
PUBLISHED BY **renew.**  
SUMMER 2019/20 • AU/NZ \$12.95  
SANCTUARY.RENEW.ORG.AU

ISSN 1833-1416



9 771833 141000





## Inside issue 49

### HOUSE PROFILES

#### 16 Southern success story

A Passive House proved perfect for comfortable living in the challenging climate of Dunedin, New Zealand.

#### 22 Mid-century modest

Preserving the essence of a 1950s home in Adelaide was the key for this budget-conscious extension project.

#### 60 Among the vines

An off-grid Passive House provides comfortable no-frills accommodation on a vineyard in Gippsland.

### 29 BACKYARD BUILDS SPECIAL

We visit studios, secondary dwellings and sensitive backyard subdivisions around Australia to explore density done well.

#### 30 Rich pickings

Building a new, highly efficient home in their backyard brings a Melbourne couple satisfaction and sustainability.

#### 38 Prefab prototype

A little gem of a backyard studio in the Blue Mountains was the testing ground for a larger project aiming for considered suburban density.

#### 44 Living laboratory

A two-apartment development on a small block in Fremantle demonstrates an alternative to endless sprawl.

#### 50 Self-built studio

Two young designers combined their skills and knowledge to create and build this modest home in the Adelaide Hills.

#### 56 More with less

In the Canberra suburbs, this compact, energy-efficient secondary dwelling will give a retired couple the opportunity to age in place.



## IDEAS & ADVICE

### 66 Getting it right from the start

Three design experts offer dos and don'ts for your sustainable build or renovation.

### 70 On the drawing board

Architect Ben Callery describes what can be done to turn around ageing 1990s-era townhouses with a sensitive renovation.

### 76 Architects Declare

Why Australian architects are taking a stand for the climate and biodiversity by declaring a climate emergency.

### 78 Design Workshop

Elizabeth Wheeler advises a Melbourne couple on how to retrofit the red brick garage in their backyard into a comfortable 'granny flat'.

### 82 Broccoli by subscription

We explore the rise of community-supported agriculture in Australia.

### 86 Fan club

Don't dismiss the humble ceiling fan as a low energy way to keep cool in style and reduce your air conditioning use.

### 92 Climate resilient homes

Renew is spearheading a campaign to make our homes healthier, more affordable and more sustainable.

## REGULARS

### 8 Lighting up Timor-Leste

### 10 Products

### 14 Reviews

### 37 Renew update

### 94 Marketplace

### 96 Designers in profile



# Southern success story

LOCATION Dunedin, New Zealand • WORDS Emma Scragg • PHOTOGRAPHY Simon Devitt



## At a glance

- Small-footprint home, simple in form and buildability for a very steep site
- Passive House-certified for thermal comfort and low running costs
- Heat recovery ventilation system provides fresh, filtered air for an allergy-prone family
- Compact living spaces designed for flexible uses

**A Passive House proved perfect for comfortable, allergy-friendly living for this family in the challenging climate of Dunedin, New Zealand.**

Two years ago, architect Rafe Maclean and his family moved from the small New Zealand town of Wanaka and set themselves up in larger Dunedin, near the bottom of the South Island, as an alternative to boarding school for their teenage daughters. Initially, they rented an uninsulated 1920s weatherboard house, the typical housing stock in this city. The cold, damp climate seeped in and exacerbated the family's allergies and asthma. Rafe saw the need for a new home that would provide healthy air as well as warmth and energy efficiency – an opportunity to put his Passive House design skills to work for his own family.

A precipitous site within native forest was found with panoramic views over the city. The only flat area on the site was the five-metre-wide no-build zone of a council wastewater easement. This along with poor soil and lack of easy

vehicle access had deterred developers but Rafe, having designed projects for similarly steep sites in Wellington, saw opportunities rather than obstacles.

The footprint was kept as small as possible to suit the site. The 140 square metre home fits neatly over two levels and provides comfortable space for four people, a dog and a gecko. The spaces are simple and well-proportioned for flexible uses. The lower level contains the living areas and a home office for Rafe and his partner Michelle, and upstairs are three bedrooms and a shared living area and study for their daughters. The roofline kicks up to the south-west to accommodate mezzanine bed platforms for the girls and provide a greater sense of space. "The family really enjoys the different spaces. It's a small house so having places to escape to is important, especially with two teenagers," says Rafe.

As this house was designed for the family and not for the resale market, Rafe had the opportunity to incorporate things clients often resist. "It is rare that clients really enjoy bright colour," he laments. By contrast, his own home stands out against its green hillside – a rectangle of silver





“The family really enjoys the different spaces. It’s a small house so having places to escape to is important, especially with two teenagers.”





# WIN

Subscribe to *Sanctuary* and you could win a **315L Sanden Eco Plus hot water heat pump valued up to \$5,000**

Sanden Eco Plus is a ground-breaking product, highly innovative, 'whisper-quiet' and extremely energy-efficient. This is the first hot water heat pump system available in Australia utilising compressed CO<sub>2</sub> refrigerant meaning the Sanden Eco Plus operates efficiently in a wide range of temperatures, most notably excelling in cold climates.

[renew.org.au/prize](https://renew.org.au/prize)



Subscribe to *Sanctuary* or join Renew by 17 April 2020 and go into the draw to win a 315L Sanden Eco Plus hot water heat pump, including installation. Open to Australian residents. Terms and conditions apply.



**Sanctuary** MODERN GREEN HOMES

**renew.**



A photograph of a modern backyard studio. The building has a dark corrugated metal roof and walls made of vertical wooden planks. Large glass doors are open, revealing a minimalist interior with a lounge chair and a floor lamp. A small square window is visible above the doors. The scene is set against a backdrop of trees and a clear sky.

# Backyard Builds Special

In the face of rising populations and urban sprawl, considered strategies to increase density in our cities and suburbs are becoming imperative. We look at a range of clever infill projects rising to the challenge: backyard studios, secondary dwellings, small-scale strata builds and sensitive subdivisions.





# Rich pickings

LOCATION Frankston, VIC • WORDS Anna Cumming • PHOTOGRAPHY Tatjana Plitt



## At a glance

- 7.9-Star all-electric new home built on subdivided suburban block
- Passive solar design, insulation and airtightness plus solar PV mean no bills and net energy export
- Innovative ground loop heating and cooling linked to heat recovery ventilation
- Recycled, salvaged and second-hand materials and furniture

**Building a new, highly efficient home in their backyard that's tailored just for them has brought this Melbourne couple satisfaction and financial sustainability.**

Arriving at Robyn and Jonathan Rich's new home in Frankston, a bayside suburb in Melbourne's south-east, the first glimpse the visitor gets is of a recycled-brick facade swathed in greenery, tucked behind the original house at the back of a deep block. Entering past flowering shrubs and under a small vine-covered verandah straight into artist Robyn's studio, the self-contained yet welcoming impression continues with a quiet, sunny living space furnished with pre-loved leather couches and more plants. Robyn's art is everywhere.

This meticulously ordered home is the couple's bespoke creation: they designed it and project-managed the build, carrying out a lot of the work themselves. Veterans of several home renovations, in 2003 they bought this block with its 1920s weatherboard house, making the move from the Mornington Peninsula to be

closer to public transport and schools. "It was a very rundown house – the best that could be said of it was that it had a nice front fence!" jokes Robyn. Though they improved it over the years, once their daughter was grown they turned their minds to their next step.

"While they have character, old houses just cost a packet to heat," says Jonathan. "With climate change looming, we wanted to build something that was largely self-sufficient for energy or even net positive." Another priority was a healthy home, as Robyn has had immune system issues. "We wanted a home that was nurturing, where we felt happy and healthy and knew that we were doing the right thing for the environment," she says.

Blessed with a large backyard to work with, the couple subdivided the block and designed a simple, square house set close to the side and back boundaries at the southern end. This allowed for excellent northern orientation for solar access. The living space opens onto a private garden, and there is also room for two double garages between the two houses. Inside are two bedrooms, Robyn's studio and a study for engineer Jonathan, an open-plan living space and kitchen, and







# Self-built studio

LOCATION Crafers West, SA • WORDS Rachael Bernstone • PHOTOGRAPHY A-HA! Design Studio



## At a glance

- Small-scale, affordable home and office for a young couple
- Designed and built by owners, learning skills on the job
- Built on the footprint of an existing double garage
- Innovative use of inexpensive, recycled and salvaged materials

**Two young designers combined their skills and knowledge to create and build this modest home for themselves in the Adelaide Hills, without having to give up avocado toast to pay for it.**

Landscape architect Isabella James and architectural graduate and landscape architect Jesse Zilm have bucked the trend that sees Generation Y struggle to get into home ownership (and famously – and unhelpfully – being advised to pass up expensive cafe breakfasts to afford it). Their story offers inspiration for others in a similar predicament.

Together Jesse and Isabella run A-HA! Design Studio, a holistic design practice that works with clients on sustainable solutions that integrate buildings and landscape. Their own home and studio is testament to what's possible with a small budget and a big idea, and a willingness to pick up tools.

Originally, the couple looked for a house to buy but, unable to find something suitable, they decided to buy

land and build instead. "Jesse was 24 and I was 25," recalls Isabella. "We were both working in small practices on the Adelaide plains and we were pretty fresh, and that enthusiasm drove this project."

"It was very challenging, but also one of the most rewarding things I've ever done," Jesse adds. "We learned so much by designing the house, putting it through council, getting our hands dirty and getting it built. It's still pretty unusual for two girls to physically build something."

The block they settled on – 1000 square metres of mature garden, subdivided from an established home in Crafers West – was appealing for several reasons. "The land is a quarter-acre block, which is the typical Australian dream, but we wanted to utilise it in a different way," Isabella says. "The average new Australian house is 230 square metres, but there was a double car garage on the site when we bought it, and we aimed to build a house on that same small footprint so that we didn't encroach on the landscape."

"The block is beautiful because it's in the hills, and we have an English style garden with old rhododendrons and camellias and lots of big established trees,"





↑  
A subdivision from an established home in the Adelaide Hills, Jesse and Isabella's block boasts a mature garden. Their home is built on the footprint of a double garage that was on the property when they bought it, and features a climbing wall on the eastern facade.



## ON THE DRAWING BOARD: Nineties townhouse turnaround

WORDS Ben Callery • PHOTOGRAPHY Jack Lovel



↑

A new deck with roof extends the living space in this Northcote townhouse transformation. Garden landscaping was included in the scope of the project and enhances the result.

**Houses only 30 years old shouldn't need major renovations. But many 1990s townhouses, often built cheaply and poorly insulated in this pre-energy ratings era, are not ageing well. Melbourne architect Ben Callery tackled one recently, demonstrating what can be done to turn these homes around.**

The 1990s: what a decade of change it was in the way we live. We switched from rollerskates to blades, tapes to CDs and brick-sized car phones to tiny Nokias. And of course snail mail

to email. U2 were the biggest band in the world, but for angsty teenagers like me, the likes of Pearl Jam provided the soundtrack to the decade.

In the years since we have moved on dramatically again. CDs are practically forgotten and our smartphones have us constantly connected to the world. The teenage angst has lifted but a sense of frustration remains, directed now towards our built environment and the lack of environmental responsiveness in our housing stock.

In this sphere, the 1990s brought the rise of the townhouse. Built on subdivisions of the quarter acre suburban block, they came semi-detached in groups of two or three. They offered





↑  
Before the turnaround. Many 1990s townhouses were built speculatively and thus cheaply, and the materials – like the timber cladding and window frames here – are often ageing badly by now. There was also poor connection to the unloved backyard. Images: Ben Callery

similar numbers of rooms to a standard detached house but with smaller footprints and more compact spaces and yards. At a time when average Australian houses were beginning to grow to obese proportions townhouses offered a more petite alternative and were cheaper to purchase and run.

Even with the more recent rise of apartments, townhouses remain a popular choice for developers and residents today. As our population grows they provide urban densification. They are also a good housing option for many demographics, from single people, couples and young families to downsizing empty nesters.

Many contemporary townhouses are far from perfect, often constructed as cost-effectively as possible by developers seeking maximum return on investment. Thankfully, our mandatory requirements for energy efficiency at least now ensure a decent minimum standard of thermal performance and encourage sensible orientation for passive solar gain. In the 1990s, before the introduction of the energy rating requirement, the thermal performance of newly built homes wasn't anywhere near as high as today. And the planning regulations didn't encourage passive solar gain for living rooms or minimum room sizes to the extent that we see today.

## THE PROJECT

When we were approached recently to renovate a 1991 townhouse in Northcote in Melbourne's inner north, we were surprised to discover just how bad they could be. This one was poorly oriented, dark and narrow, with low ceilings. It's not unusual to be asked to design a renovation and upgrade of a 100-year-old heritage Victorian terrace or a 1930s Californian bungalow, but a 1990s house is an unusual brief, although one that will no doubt become more common. They are approaching middle age and need updating both cosmetically and, more importantly, thermally, as demanded by occupants who want to minimise their environmental footprint. In 1991 U2's lead singer

Bono (never short of an opinion on big issues) sang in 'Acrobat', "I'd join the movement if there was one I could believe in". At that time the environment was a peripheral concern for many. But now almost 30 years later, it is probably the one movement that unites us all.

This particular project came our way because the townhouse had been bought by my parents-in-law, a downsizing couple. We had advised them, pre-purchase, of its existing problems, but these concerns were outweighed by its combination of off-street parking, reasonable asking price and great location in an established neighbourhood, with public transport nearby, an awesome cafe across the road and grandkids a few streets away.

We felt compelled from an environmental point of view to take up the challenge of making this building better. Thermally it was terrible, requiring large energy input to maintain comfortable temperatures. But we couldn't just demolish it. The embodied energy contained in a structure built only 30 years ago is too valuable to just knock it down and build new.

Like many townhouses of this era, it was stylistically confused, featuring ornate detailing like bay windows, timber fretwork and elaborate ceiling roses. All of this would have been lovely in a Victorian terrace house with soaring ceilings, but made a house with 2.5-metre ceilings feel really squat and pokey. The purpose of the external roller shutters was unclear: were they intended to block out sun (along with natural light and ventilation) or provide security in this generally friendly neighbourhood?

Most difficult to reconcile was its orientation. Built to maximise cost effectiveness through repetition (as is often the case), its floor plan was a mirror image of its townhouse pair. So while the neighbour's living room enjoyed a lovely northern orientation, this house had its living spaces facing south and west. As a result the rooms were dark and cold in winter and hot in summer.



## DECLARING FOR THE CLIMATE:

Australian architects take a stand

WORDS Caroline Pidcock

Readers of this magazine will be very familiar with both the need for and benefits of a sustainable – or better, regenerative – construction industry. I am sure that like me, they are also astounded at the lack of real and effective action in this arena. Finally, though, things are a-changing.

More broadly, the climate science is clear and it is becoming increasingly obvious that we are facing nothing short of a climate emergency. In this context, and for the first time in history, architects have banded together globally to take a leadership position on sustainability. Architects Declare is an international call to action to acknowledge the twin crises of climate breakdown and biodiversity loss as the most serious issues of our time and declare a climate emergency. In July this year, it was launched in Australia.

Within a month, almost 500 architects – including 12 Australian Institute of Architects Gold Medallists and Australia's only Pritzker Architecture Prize winner – had pledged through Australian Architects Declare to take action. Not just the die-hard environmentalists of our profession have added their voices, but the widest possible range of architects who all realise they can – and must – be part of the solution to the emergency we face.

The first declaration was made on 30 May this year by the 17 winners of the UK's prestigious architecture award, the Stirling Prize – see [www.architectsdeclare.com](http://www.architectsdeclare.com) for more. The Architects Declare movement has since expanded to other countries including Norway, Italy, New Zealand and Canada, and similar declarations have now been made by engineers, landscape architects, students, educators and other industry professionals throughout the world via [www.constructiondeclares.com](http://www.constructiondeclares.com).

For everyone working in the construction industry, meeting the needs of our society without breaching the earth's ecological boundaries will demand a paradigm shift in our behaviour. Together with our clients, we will need to commission, design and construct buildings, cities and infrastructure as indivisible components of a larger, constantly regenerating and self-sustaining system.

As readers of *Sanctuary* know, the research and technology exist for us to begin that transformation now. What has been



↑

Melbourne architecture firm Kennedy Nolan was an early signatory to Australian Architects Declare and the whole team attended the Global Climate Strike in September. "Architects Declare has made us aware that we need to be our own disruptor to our systems and working environment," says principal Rachel Nolan. "We're interested in what can be embedded and maybe not even talked about in a building: responsible specifications, construction systems and design that become the standard in our practice." Image: Kennedy Nolan

lacking is collective will.

The movement is spontaneous, de-centralised and non-hierarchical, and is by its very nature disruptive. Instead of relying on governing bodies or associations to take the lead, it urges each architect to take responsibility for action in their own lives and practices. Through inverting the traditional method of advocacy and policy deployment, the movement fosters a bottom-up approach to community-led change-making.

Specifically, each architect joining the movement pledges to:

- Raise awareness of the climate and biodiversity emergencies and the urgent need for action amongst our clients and supply chains
- Advocate for faster change in our industry towards regenerative design practices and a higher governmental funding priority to support this



## DESIGN WORKSHOP:

### Garage to granny flat



#### PROJECT TYPE

Garage renovation

#### LOCATION

Melbourne, VIC

#### EXISTING BUILDING SIZE

48m<sup>2</sup>

#### LAND SIZE

950m<sup>2</sup>

#### BUDGET

\$50,000–\$60,000

#### THE BRIEF

- Retrofit a backyard garage to provide family accommodation during an upcoming house renovation
- Maximise thermal efficiency of the building while minimising cost
- Bring more light in
- Create a space that can house grandparents or guests in the future



**Alicia Brown and Marc Horler are planning to retrofit the red brick garage in their backyard as a temporary living space for their family during house renovations, with an eye to creating a useful ‘granny flat’ for the future too. Building designer Elizabeth Wheeler of Future Focused advises them on a workable layout and what they can achieve with their budget while complying with local regulations.**

As part of the planning for a major renovation of their family home in a bayside suburb of Melbourne, Alicia and Marc are considering what they and their two children, aged five and eight, will need to live comfortably during that process.

The garage at the bottom of their garden – currently used as a storage shed – could be retrofitted into a small home to accommodate them during the

renovations, but the couple need advice about how best to bring light into the space, put in a new floor, and increase its thermal efficiency. They will also need to contend with getting services to the building.

“We love the shed at the back of our block. It’s a beautiful piece of history and I get so much enjoyment from that,” Alicia says. They hope that the building’s northerly aspect will allow them to maximise solar gain.

Marc and Alicia want to create two bedrooms as well as a kitchen, bathroom, dining area, living area and as much storage as possible. They plan to use as many recycled materials as they can, including spare gas appliances.

Transforming the structure into a liveable space will require some work. “It is quite a dusty space and hard to keep clean at present,” Alicia says. “The wind blows grass clippings and leaves into the shed from the yard.”

Given their budget, Alicia and Marc will need to be clever about doing the



# Broccoli by subscription

## The rise of community-supported agriculture in Australia

WORDS Sarah Coles

**People subscribe to magazines and newspapers, so why not food? With community-supported agriculture, you can do just that. This model of food production and distribution connects farmers and eaters, supports local and small-scale enterprises and offers financial, social and environmental benefits, and it's gaining ground around the country.**



↑ Vegetable bounty: Longley Organic Farm runs a CSA scheme in Tasmania. Image: Nina Van Hartscamp

Community-supported agriculture (CSA) as we know it today was born out of Japan's *teikei* system, dating to the 1970s, in which consumers purchase directly from farmers. It's a model based on relationships, not just transactions: the details differ according to the scheme, but the fundamental idea is that people purchase shares in a farm's projected harvest in advance and for a set period (a season, or a year) and receive regular food deliveries. In this way, the economic risk is shared between farmer and shareholders, who in return for their upfront investment receive fresh, seasonal produce and the ability to be more involved in where their food is coming from.

Duang Tengtrirat, who now calls Chewton in central Victoria home, was instrumental in setting up one of the first CSAs in the USA. In 1979, she was living in Seattle and working with Hmong, Mien and Lao refugees from the Vietnam War, many of whom were farmers. After receiving a grant, the refugee advocates

leased a large plot of land and the refugees began to farm. "We hadn't thought of what we were going to do with the produce," Duang says. "We decided that we would start selling shares of the produce to people." It worked. Locals bought shares and picked up a weekly box from Pike Place Market, a well-known Seattle institution. "We didn't even have the term CSA in those days," she recalls.

Duang travelled to the US last year and what she found was encouraging: "There are now 1300 CSAs in the Pacific Northwest alone!" And the model, popular in the US and Europe for decades, is now gaining traction across Australia, with examples in every state and territory. Depending on where you live, you can join a CSA for your vegetables, fruit, dairy, meat, eggs, flowers and even bread.

It is a busy picking day when I turn up to Gung Hoe Growers at Harcourt, near Castlemaine, north-west of Melbourne. Mel Willard and Sas Allardice have been farming here since 2015 and started a CSA





↑  
Ant of Tellurian Fruit Gardens and Mel and Sas of Gung Hoe Growers are part of the Harcourt Organic Farming Co-op, a group of farmers who lease land on a single farm. Community-supported agriculture is a core part of the co-op's model for sustainable food production. Image: Oliver Holmgren

scheme soon after. Last year, more than 50 shareholders received weekly boxes of organic vegetables and herbs.

Mel and Sas are driven by issues of food security; they want people to be able to access good food, even if they are on a low income, and they offer an option for people to volunteer on the farm as part payment for their vegetables. They are also proponents of local food. "Bendigo [32km] is the furthest our produce goes," Sas says. "95 per cent goes straight to Castlemaine." For Mel, it is about "food going straight to homes and meeting the people eating our food. Educating not in a top-down way but through genuine conversation."

For many farmers, the 'community-

→  
Interns and volunteers plant out seedlings at Longley Organic Farms; freshly picked produce is packed in sturdy reusable bags for collection by the farm's CSA members. Images: James Hutchinson

supported' part of the model is a boon, as it offers financial security and an ability to plan ahead. Longley Organic Farm in Tasmania is based on the minimal-till biointensive market farming model of Quebecois farmer Jean M Fortier, an advocate for ecological, human-scale agriculture. Owner James Hutchinson says the practice is about "soil first", and sequestering carbon to improve soil health in the long term. "This brings multiple benefits including soil microbial capacity, retention of nutrients, temperature buffering, water-holding capacity, and ultimately mitigating climate change as suggested in the Paris climate agreement," he says. His CSA connects members with a

