

MODERN GREEN HOMES Sanctuary

INSIDE ISSUE 34 115+ green products and design tips; saving seeds; tiny project homes; Passivhaus in Australia; building with earth; financing green home upgrades



GREEN HOMES

FOR LESS



Windows clear cut
Ideal design in Auckland
Open-source house plans

WIN

A home battery storage
system from Enphase

Offer open to Australian and New Zealand
residents only, details p75

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City greening

The site of a former Greek community garden inspired an outward-looking approach for Mark and Lisa's Brisbane house design, securing its food growing legacy and plentiful green space around and above their new home.

WORDS Emma Scragg

PHOTOGRAPHY Kate Mathieson

VACANT, QUIET LOTS IN INNER URBAN

areas are rare, but architects Lisa and Mark stumbled across one on a morning walk. As keen gardeners, they saw added appeal in the block's previous life as a community food garden tended by its former neighbour, George. It was once so productive that his crops supplied not only his own household, but neighbours, friends and even local Greek restaurants.

When Lisa and Mark bought the block, the once fruitful plots had given way to weeds following George's passing a few years earlier. The couple set about restoring the garden's cultural value, and using it as inspiration for their joint design.

Their new house sits back from the north boundary to optimise winter sun and preserve the original raised garden bed, which supports herbs originating from its first crop. A compact design was needed for the narrow block, which suited Lisa and Mark's philosophy "not to build

larger than necessary." Movable screens, generous ceiling heights, wide openings to the outdoors and a large deck make the spaces feel more generous and let the home expand for visitors.

A slightly elevated boardwalk leads to the house, allowing a direct connection with nature that continues throughout. Stepping down the slope along the narrow block, the internal spaces hover just above to "maximise interaction with the food garden", explains Lisa. The cantilevered pathway protects the garden from footprints, it also allows plants to grow underneath in wetter times, and for better stormwater flow.

As the block had never been built on, Mark says they felt a strong need to "replace the amount of garden we were going to displace, by putting it back on the roof". The original design was a single-level pavilion with a simple green roof over its entirety, but planning permission



The block's former life as a community vegetable garden provided inspiration and the basis for Lisa and Mark's joint design. Three primary colours were added as accents internally and externally to what is otherwise a neutral, natural colour scheme.



The 90-square-metre extensive green roof is heavily planted and provides significant thermal insulation to the living spaces below, as well as controlled and filtered rainwater run-off, which they hope soon to be connected to their rainwater storage.



Not only does the upper level master bedroom have an enviable morning outlook across the colourful green roof, a clerestory moonlight offers a nightly vista of the stars. Mark, originally from Dublin, was captivated by the southern sky when he first emigrated, and wanted to capture his love of it in the house design. The master bedroom also benefits from the cooling effect of the green roof, while large louvre windows help to purge rising heat from the rest of the house.

Passive warehouse

An inner Melbourne warehouse is reimagined as a contemporary, comfortable 'machine for living' through the application of Passive House principles.

WORDS Verity Campbell
PHOTOGRAPHY Trevor Mein

LE CORBUSIER'S FAMOUS ASSERTION, "A house is a machine for living in", was a guiding principle for John and Kate in the refurbishment of their two-storey warehouse conversion in West Melbourne. More industrial relic than well-oiled machine, the warehouse needed a functional and sustainable makeover to suit the couple and their two children. They wanted to rearrange the layout to make it work better, while retaining the basic form upstairs with the great views of the city, access to daylight and outdoor living. "We also wanted to improve sustainability through the Passive House principles that we had heard about and were keen to introduce," says John.

Di Mase Architects was enlisted to "fix" the home. The existing structure was a "rabbit warren", with entry via the main bedroom. So the team at Di Mase (Antony Di Mase, Jim Stewart and Catherine Matthews) set to work on a floor plan that would resolve the issue. Their solution was to make the two-storey void and passageway the dramatic focal point of the home, with the main entrance and primary circulation space seamlessly connecting both floors.

While principal architect Antony Di Mase had had plenty of experience restructuring floor plans, Passive House (*Passivhaus*) – a building concept developed in Germany and used widely in Europe





The light-filled void serves as the dramatic focal point for the reimagined space. It also allows good solar gain to the thermally massive downstairs entry, with concrete floors and reclaimed brick wall, highlighting the warehouse's original, and new, stylish character.



The ground floor entrance leads to an office and space-efficient library, separated by striking internal steel-framed glazing, which allows borrowed light to infuse the space. The existing concrete floor was retained and restored. Large amounts of insulation and sealing have helped keep the home cool throughout summer, reaching only 24 degrees celsius downstairs and 27 upstairs, even as it tipped 42 outside during a recent heatwave.

Right at home

A recently renovated house in Newcastle that shares attributes with a well-designed yacht is the perfect home port for this young family.

WORDS Rachael Bernstone

PHOTOGRAPHY Alexander McIntyre

THIS HOUSE IN NEWCASTLE MAY BE small, but it makes up for its diminutive size with cleverly designed spaces that accommodate a family of three in comfort and style. Marine industry professional Nairn Johnston and his psychologist wife Emily moved back to Newcastle with their young son to be closer to extended family, after living in Sydney for several years. The couple purchased a two-bedroom miner's cottage in the same street as relatives, and appointed local architect Jason Elsley, of Derive Architecture & Design, to help with the renovation.

"We wanted a very small renovation that wouldn't cost the world but would give a big result," Nairn recalls. "We didn't add much in terms of square metres, but the change it made to the house is massive. Now the house feels really spacious, has more natural light, and brings the outside in. We wanted a clean modern addition for our 114-year-old cottage."

Jason opted to extend the footprint to the side boundary rather than towards the

back fence, to preserve as much outdoor space as possible. The new back room, which combines kitchen, dining and living areas, feels larger than its dimensions would suggest, thanks to existing high ceilings and a new double-height void above the kitchen. The clerestory windows expand internal sightlines to a row of distant trees, an idea that was important to Emily, and function as a thermal chimney to help purge heat in summer.

Recycled windows and doors placed on either side of the kitchen connect to front and rear gardens, and capture cross-flow breezes for passive ventilation. A high window on the southern side is positioned for glimpses of the Southern Cross, in a nod to navigation at sea.

The back room was extensively insulated during the renovation, with Earthwool battens added to the walls and ceiling, and gaps in the existing timber floor were filled to exclude draughts. The new north-east-facing timber deck plays a vital role in managing seasonal internal comfort.



"Nairn rigs up tension sails on the rear deck during summer for passive shading, rather than using fixed awnings," Jason says.

"The idea was that Nairn and Emily would manage the house actively and in tune with the weather, like a sailor would manage a yacht."

The kitchen also reflects Nairn's nautical experience. "When Nairn was travelling the world sailing, he really understood how to live in a compact environment, but to also make things work efficiently," Jason says. "I'm not typically a fan of open plan living in such small arrangements, because it can feel like you are living in the kitchen, so it was really important that the cabinetry had visual interest and vitality."

After a five-month build in which Nairn played a hands-on role, especially in the selection and preparation of recycled building materials, the family couldn't be happier with their modest, but very liveable house. "It's a very easy house to live in, with the main space being that big 'aft' area



Nairn and Emily were interested in the 'story' of materials and wanted to reuse as much as possible during the renovation, so had stockpiled various things over the years. The tensioned awning used over the deck is braced by welded steel sections from the former lift structure of the Great Northern Hotel.



The renovated miner's cottage feels expansive, despite only an extra 30 square metres being added to its footprint. The existing timber floors were restored and float-filled in order to minimise underfloor draughts.



Over to you



Off-the-shelf housing is for many a rare chance at home ownership – which, though out of the reach of many, is still highly prized in Australia. We look at some innovative takes on the project home that aim to shift the power from the developer to you. Plus, is sustainability finally finding a foothold in the mass market project home space?

Project green

Most large-scale project home builders now have a low-energy offering in the catalogue of possible house designs. While for some it may not go beyond a product visual, others are making real efforts to encourage sustainable living.

VOLUME HOME BUILDERS PRODUCE

the vast bulk of new homes in Australia and continue to have significant influence on the way that residential development happens. Sustainability expert and architect Sid Thoo was pleasantly surprised to be approached by one of Australia's biggest development companies – Mirvac – to design a high-performing demonstration house for Osprey Waters, a 470-lot residential subdivision in Mandurah, 75 kilometres outside of Perth. Recommended after being shortlisted as one of six finalists in the Landcorp Gen Y Demonstration House Design Competition, the brief was to design a home that set a high standard of quality and sustainability for the entire development.

In turn, Sid has been impressed by Mirvac's efforts to protect the habitat of the magnificent bird of prey which gave the development its name, and which have a close-by breeding site. "A lot of work has been done by the landscape architect and

environmental consultant to sensitively enhance and conserve the local flora and fauna," he says. Mirvac has an in-house sustainability team, but more unusually 'change agents' embedded throughout the organisation to help "implement opportunities for positive disruption and innovation".

Fellow volume home developer Henley Homes has also worked to create a reputation for sustainability. Adam Selvy, the company's energy, sustainability and innovation manager, says the creation of their first high-performing design several years ago was due to the influence of director Peter Hayes, who "genuinely wants to see the world left in a better state." The company worked with CSIRO to create a zero carbon house in 2010, and now offer a suite of homes that can be adapted from 6 to 9 Stars.

Better orientation, Adam says, is effectively incentivised as it costs less to make a well-orientated design compliant

A small idea

A tiny 7 Star project home on the outskirts of Geelong represents the culmination of years of practice and thinking for builder and designer Sally Wills.

WORDS Emily Braham

PHOTOGRAPHY Sean Fennessy

AS A PROJECT HOME DESIGNER, SALLY

Wills is something of an anomaly. But it's not just the fact that she's one of a handful of female builders in a male-dominated industry that surprises. Her approach to design is also one that bucks the national trend; she encourages her clients to opt for smaller – and cheaper – energy-efficient homes.

"I start with the premise of designing as small as possible," Sally explains. She says there are several ways to limit cost and size beyond the number of bedrooms. "I try to encourage just one bathroom, for example, and then compromise on another toilet if they feel it's needed, rather than two bathrooms."

Her newly founded company Small Change Design's first constructed project, on the outskirts of Geelong, Victoria, is just 56 square metres, but size-wise, this is midrange in the suite of adaptable designs Sally offers. There's around 10 customisable plans, which come in xsmall – a minute home of 20 to 46 square metres; the xsmall of 46 to 60 square metres, or the simply small – a more roomy, but decidedly modest 61 to 80-square-metre design.

Sally worked as a building designer in Western Australia for 12 years, where she

developed an interest in energy-efficient housing. She found that people were willing to be convinced on technology like double glazing, insulation and water saving, but not necessarily on size. "I realised it would probably do the environment a much bigger favour if we cut the house size in half," she says. "A huge component of the impact of housing is the embodied energy, and we are not measuring that as an issue – some research says that it can equate to around 15 years of operational energy."

In addition to designing and building tiny project homes, Sally has lobbied the state government to relax rules for small secondary dwellings, a move she says would allow us to build at greater density in a way that gives people flexibility over how they live. While she acknowledges small living isn't for everyone, and may not suit families, she suggests that energy-efficient additions can offer changes in occupancy and use, with people moving between dwellings at different life stages.

Her designs are now also available in Queensland, New South Wales and the Australian Capital Territory, where they are constructed by designer and builder Kevin Ryan of Jemade Design and Construction.



A loft-style master bedroom is accessed by a ladder, with storage space serving as a dividing wall. An operable high-level window helps expel built up heat. Sally, who lived in the house when it was first built, but has since sold it, says the reverse cycle air conditioner was rarely needed in summer, with the insulation, thermally massive concrete slab and shading helping to keep the space cool.

A new normal

A pop-up prefabricated house takes aim at our collective high carbon lifestyles and asks who we should really be keeping up with.



At under 70-square-metres – Ecoliv’s prefab pop up display is more than three times smaller than the average Australian family home. The off-grid home also produces more energy than it uses, with excess power stored with an Enphase battery allowing it to be used when needed rather than exported to the grid.

FORMERLY IN CONSUMER PR, TAMARA DIMATTINA’S

career took an unexpected turn after a trip to India where she saw a different perspective on waste. “I felt bad about the way we were consuming after I went to the slums in Mumbai and saw how they valued things that were thrown away,” she explains. This inspired Tamara to travel to Antarctica to learn firsthand about climate change, study at the Centre For Sustainability Leadership, and to launch Buy Nothing New Month in an effort to tackle everyday over-consumption.

The widely acclaimed The New Joneses project is the evolution of her first foray into sustainable behaviour change. TNJ seeks to raise the same questions around waste and consumption, but in a public, interactive setting.

The project’s hub is a 68-square-metre off-grid prefab home by Ecoliv Buildings, which will sit in Melbourne’s City Square during the Sustainable Living Festival. The pop-up home aims to promote low-carbon households, but also poses questions across the full gamut of ecological considerations. “Everything from our choice of bank to our choice of toilet paper,” will be tackled by the demonstration house, says Tamara. She is hoping people come away from the square with a piqued interest in the environmental footprint of things such as their furniture, food and daily commute.

The 8 Star house showcases the new battery from Enphase,

Coastal gem

Artists Tamzen and Sam Brewster imagined a low-energy creative sanctuary in the idyllic surrounds of Tasmania's famed Freycinet National Park. The understated result appears almost of the landscape itself, even its name borrowed from the ground below.



The high-performing Aplite House borrows from its captivating surrounds, without detracting from it. Owners Sam and Tamzen did extensive research to ensure the home, which serves as a creative sanctuary, family retreat and guest house, would have minimal impact on the environment, both in terms of materials used and operational energy use.





↑ Inside, furnishings were carefully chosen by the creative couple to support local artists. The ceramic light fittings were handmade by Sharan Elran. The insulated concrete slab floor is 160 millimetres-thick on the northern side to minimise the lag or loss of heat overnight.

WORDS Gabi Mocatta

PHOTOGRAPHY Tamzen Brewster

IF EVERY NEW HOME RESPONDED TO its site as well as Tamzen and Sam Brewster's, the built environment would be much more attractive and far less damaging. The off-grid guesthouse, set remotely on some 200 acres of bushland at Friendly Beaches on Tasmania's east coast, while striking, has the modesty to blend in quietly to its pristine surrounds thanks to the owner-builders' strong artistic sense and commitment to low-impact design.

Aplite House – named after a quartz-based rock found on the Freycinet Peninsula where the house is situated – has been built both as a family retreat and a guesthouse. The couple are also planning an annual artist-in-residence program for national and international artists with a

focus on the wild environment.

"For us as a family, the house needed to have a sense of homely comfort, and a good passive solar design. For visitors, we wanted it to be an experience," says Sam. "We wanted people to be able to retreat, unwind, to enjoy the remoteness of the natural surroundings, and also to be able to come from anywhere in the world and feel comfortable in this setting." They also wanted the house to be educational. "In terms of living off-grid, this is an example of what great things can be done," says Sam.

The couple had two architects submit briefs for the design. There was no set house site and the owners and prospective architects walked the property extensively to find the right location. Architect Stephen



↑ The kitchen benches and table were handcrafted by Sam from a single Tasmanian myrtle, milled and dried in north-west Tasmania close to where it was harvested from a friend's property (it was dying and needed to be removed). The timber was quarter-sawn to minimise radial movement from the timber grain.

Geason's design for a site with western views over the Moulting Lagoon wetlands won them over. "One of the specific challenges of the site was to take in the water views to the west, and still allow solar gain from the north," says Sam.

Stephen set about designing two near-parallel, adjoined pavilions that would create an assorted mix of experiences and connections to the landscape. "The idea was that the house should be a 'corridor' to the outside," as he puts it, "but also offer internal retreat, security and shelter." The architect designed a kitchen, dining and living pavilion with extensive glazing on three sides, with sliding doors onto multiple decks that experience different sun and wind conditions. Three steps

Saving seed

Seed saving – the act of saving seed from vegetables, grains, herbs and flowers – has a long history. Sarah Coles speaks to Clive Blazey, founder of The Diggers Club, author of seven books on gardening and co-founder of The Safe Food Foundation, about what we could gain from this ancient practice.

WORDS Sarah Coles

THE SVALBARD GLOBAL SEED BANK, on a remote island halfway between mainland Norway and the North Pole, contains the seeds of nearly 4,000 plant species. The vault, deep in the permafrost, is designed to protect the genetic heritage of more than 860,000 seed samples from sea-level rise, earthquakes and extremes of temperature. Plant scientists and farmers need access to genetic diversity to breed and grow food, and the Svalbard Vault is the most diverse collection of food crop seeds in existence.

During the war in Syria, scientists from the International Centre for Agricultural Research in the Dry Area smuggled seed out of Aleppo in batches to be saved in the Svalbard Vault. Last year, ICARDA was the first group to recover seeds from the vault, with the seeds now safely planted in Lebanon.

Until recently the act of saving seed was

widely practiced. Seed saving preserves cultural identity, and promotes self-reliance. Keeping seed from one year to the next also saves money and trading seed is a meaningful exchange.

There are different types of seeds – heirloom and hybrid. Open pollinated seed (what we'd call heirloom seeds if they are more than 50 years old) are true to type and the offspring will have the same characteristics as the parent. However, most seed companies concentrate on breeding hybrids. Hybrids are not suitable for seed saving because they are prone to inbreeding or are sterile.

In the past two decades, seed companies have introduced intellectual property rights into the mix. Farmers sign licensing agreements, committing to not saving seed and instead purchase new seed with each season. →

