MODERN GREEN HOMES

Sanctuary

ISSUE 72

Award-winning off-grid home in ochre tones; Canberra duplex rejigged for light; green getaways; True Zero Carbon Challenge winners; garden experiments and more

Celebrating

20 YEARS

SHOWCASING GREAT GREEN DESIGN

WIN

A furniture and interior design package from Moss Made, valued at $6,000

Offer open to Australian residents. Details page 63

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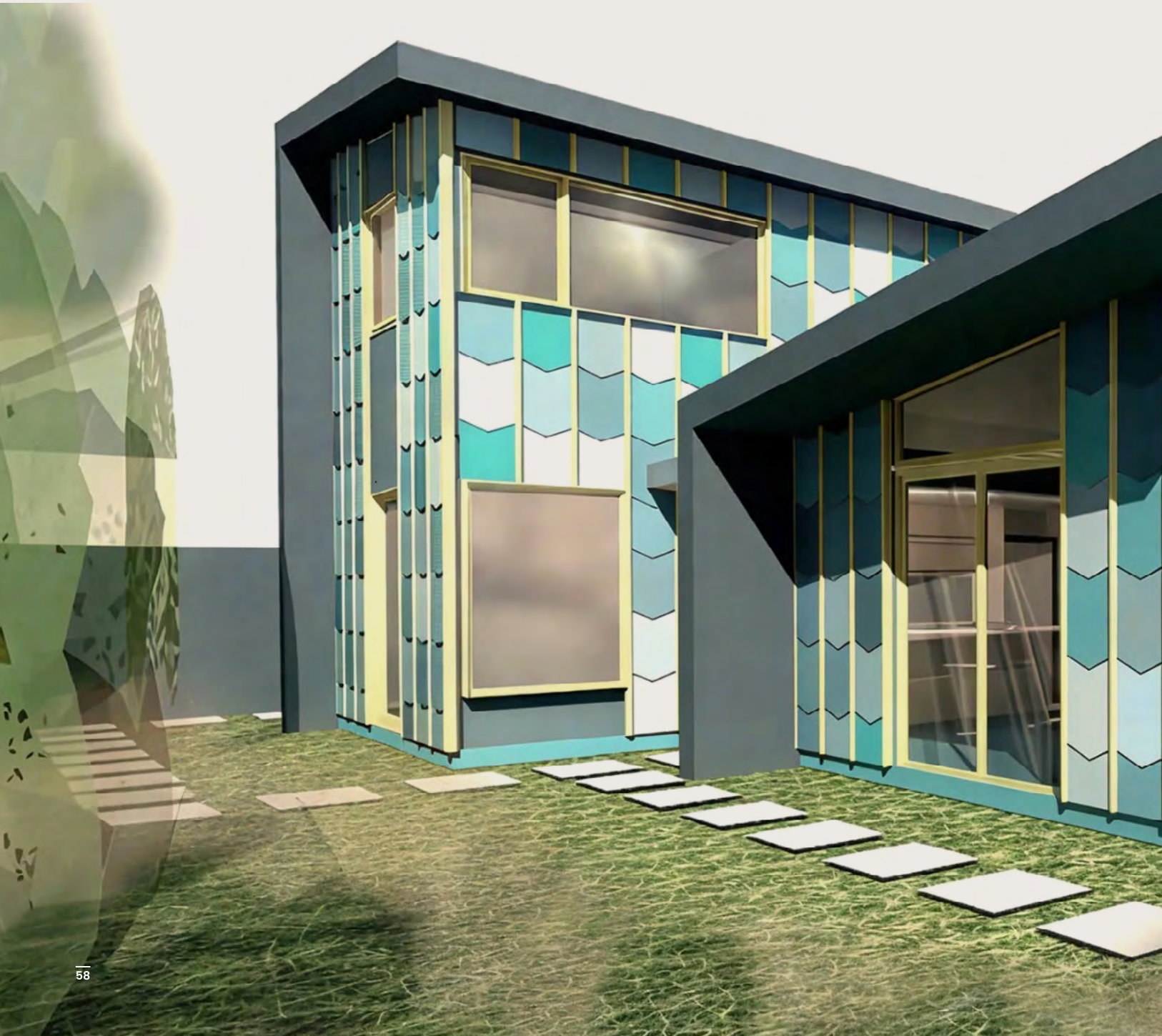
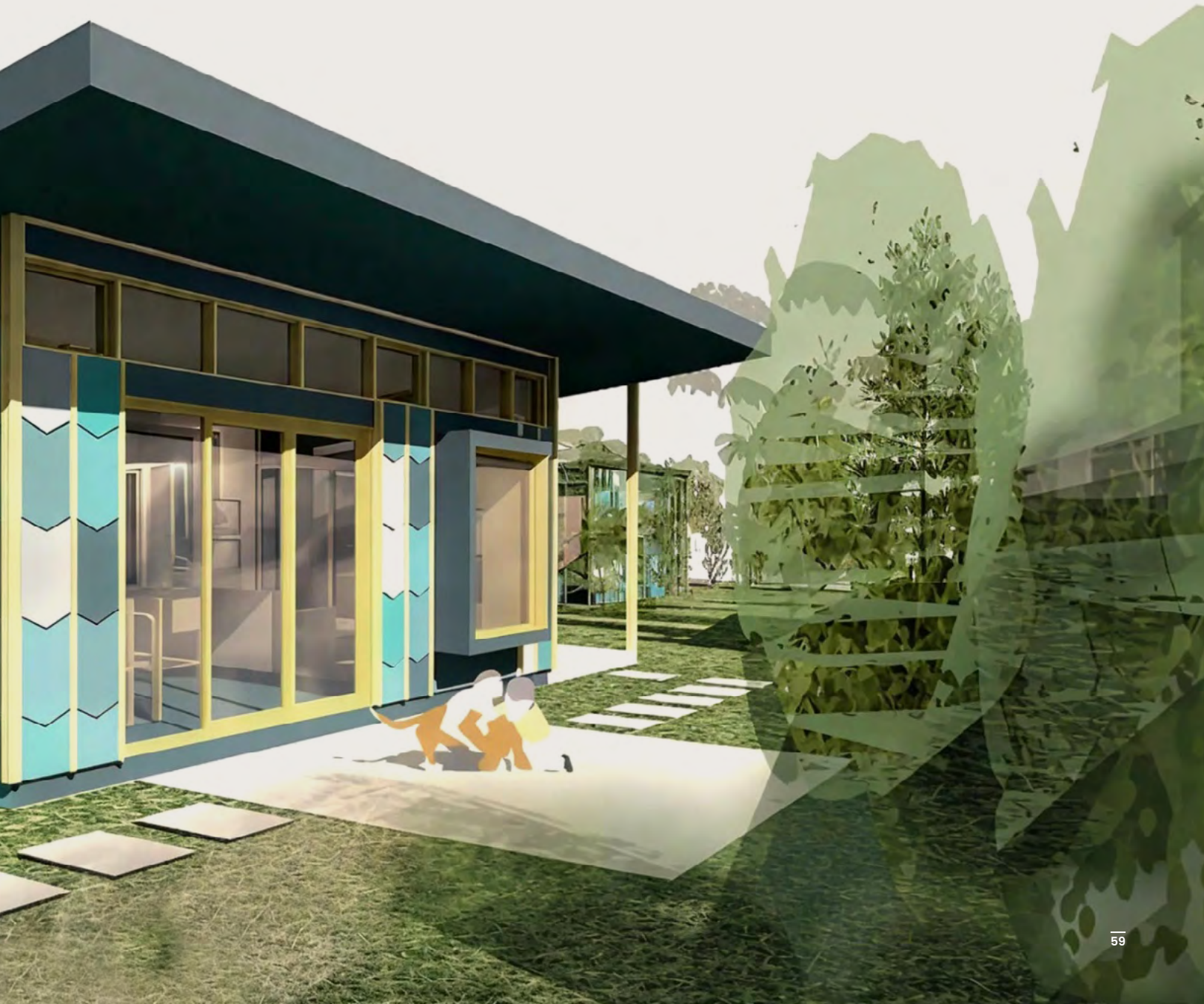
WORDS
Danielle Johnston

Below Bricolage House incorporates salvaged materials, flexible spaces to minimise its footprint, and gardens that enhance biodiversity. The home contributes to environmental restoration and generates more energy than it consumes. This winning design exemplifies how designers and energy assessors can work together to create truly sustainable homes.



BRICOLAGE HOUSE
A true winner

With this year's True Zero Carbon Challenge underway, Design Matters National CEO Danielle Johnston sits down with the 2024 national award winners to discuss their outstanding design.



The True Zero Carbon Challenge (TZCC) is a biennial design competition, developed by Design Matters National (DMN), that advances the roadmap to true net zero housing. It does this by challenging professionals to design homes that pay back their entire carbon debt by 2050, and produce more energy than they consume over a year through energy-efficient design and solar photovoltaic integration.

As the description suggests, TZCC is a tough gig, but it is preparing the industry to meet the challenges of the low-carbon future.

Last year, Hobart-based architect Uta Green of Green Design Architects and energy assessor Rebecca Boyle of Aspire Sustainability took out the TZCC's top gong with their innovative Bricolage House. I had a chat with them about the challenges and opportunities of meeting the competition's brief.

Q: You created an imaginative and joyful home with innovative ideas that result in lower embodied energy, while also performing well in the Tasmanian cold climate and offering flexible usage options. How did you approach this design challenge?

A: Beyond minimising the operational and embodied energy, we focused on using non-toxic materials, saving water, using local species for landscaping, and future-proofing: generally, employing a good deal of common sense. It's important that a home is practical, space-efficient, versatile and flexible in use.

In Bricolage, we have designed a building that is small, simple and sensible. A home should be sustainable, and it should also be beautiful and promote the health and happiness of its occupants, as these are the places we will want to retain and maintain into the future.

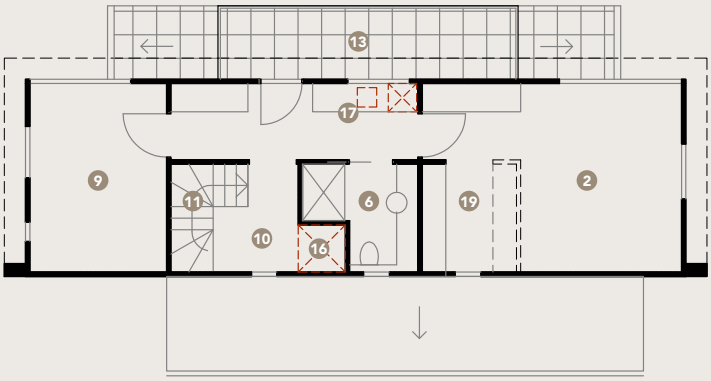
Q: What are the tangible differences between Bricolage House and a typical Australian new-build home?

A: First, size. With the competition's budget – a maximum of $700,000 – a high quality of finishes, detailing and performance can only be achieved if the building is compact. The relatively small size of the house also helps keep the embodied carbon moderate, and the double-storey design leaves more room for the garden and provides occupants with more sunlight, privacy and views. Prefabrication reduces building cost and time.

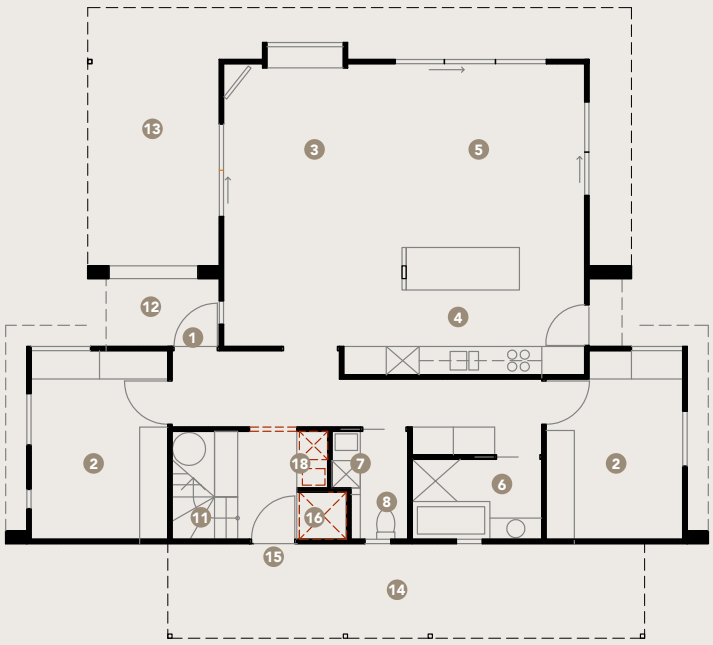
After reducing the physical size and thus the need for materials, the next thing to do is to use recycled materials. Australia lags behind Europe when it comes to material banks. We need to develop a culture of dismantling rather than demolishing buildings, so copious amounts of recycled building elements can be readily available for reuse in construction – this is known as 'urban mining'. The French word 'bricolage' means an artwork created from a diverse range of things that happen to be available. In this spirit, we developed a facade system made from sheet material offcuts that are traditionally sent to landfill.

Next, we need to consider using materials with low embodied carbon: that is, the carbon footprint caused by mining or growing a material, its fabrication, transport, maintenance and disposal. This is where the carbon calculation tool developed by TZCC founder Jeremy Spencer comes in. It is a brilliant way of comparing the carbon impacts of various building materials. Bricolage House has total embodied carbon of 147.2 tonnes, or 0.8 tonnes per square metre, and will reach true zero carbon (neutral) by 2042.

UPPER FLOOR PLAN



GROUND FLOOR PLAN



LEGEND

● Possible alterations to create two dwellings

1. Entry
2. Bedroom
3. Living
4. Kitchen
5. Dining
6. Bathroom
7. Laundry
8. Toilet
9. 'Room of requirement'
10. Nook
11. Stairs
12. Porch
13. Terrace
14. Carport
15. Future separate entrance
16. Future lift
17. Future kitchenette
18. Future second laundry
19. Future walk-in robe

Above Energy assessor Rebecca Boyle and architect Uta Green are keenly aware of the advantages of working together from the early stages of a design in order to achieve the best energy performance possible: an important aim of the True Zero Carbon Challenge.

AIMS OF THE TRUE ZERO CARBON CHALLENGE

1. To get thermal assessors working with designers at concept stage, to practise leveraging the power of the NatHERS Whole of Home rating tools in driving net zero outcomes.

2. To bring embodied carbon into the calculation and raise the issue to prominence in the industry.

3. To provide cost-effective, practical examples of desirable, truly net zero homes that the industry can follow.

HOW TO ENTER TZCC 2026

Entry is open to Building Designers and Architects, NatHERS-Accredited Energy Efficiency Assessors (EEAs), and current students of Architecture, Building Design or Energy Efficiency. Entry fees ($600 for DMN members; $1,200 for others) cover training in low-carbon design (10 technical CPD points), database and carbon calculation tools, and resources and support provided throughout the Challenge, plus attendance at the awards ceremony at the culmination of the Challenge. Entrants should allocate 60+ hours to complete the Challenge over three to six months.

For more information and to enter, visit: bit.ly/TZCC2026

Q: How would the elements of your design allow the house's occupants to thrive, and evolve their use of the house over time as their needs and life stages change?

A: Our design allows many scenarios for flexible living. We achieve this with minimal building adaptations by closing internal doors and providing two separate entrances for when the house is occupied by two parties. There is a storage space that is destined to be converted into a lift should the need arise, and further storage cupboards set aside for a possible future laundry and kitchenette, should the house be divided into two separate dwellings. Privacy is provided by separation into two floors, while retaining outlook and solar access to all rooms.

Q: Your design has a Harry Potter-esque 'Room of Requirement'. Tell us more about this feature.

A: This is a flexible space. It can be used as a home office, bedroom, playroom or craft room, or as a living space for occupants such as grandparents or tenants if the top floor becomes a separate flat.

Q: The Challenge required you to work as a team, involving the energy assessor in the design process from the get-go. Design Matters National, as Australia's largest professional body for building designers and energy assessors, encourages early collaboration between energy assessors and designers. Was this a challenge for you both? What benefits does this collaboration bring to a design?

A: Not a challenge at all! We have known each other for years and work together in this way all the time. We believe it's important to use the energy rating as a design tool, so we can get the best performance from a building while the design is still flexible. With an iterative approach we can test variations like different window arrangements or types of insulation, predict future heating costs, and calculate when a more expensive element (like better windows) will pay for itself.

In Bricolage House, we have delivered a delightful, happy home design with a strong environmental message. The house is light-filled and warm. The kitchen-living-dining room is the heart of the home, where family time can be enjoyed, with access to the various garden zones and all-day sunlight. This fun house makes recycling sexy and engages the imagination, helping raise awareness in the community for circularity and net zero design. Pushing the boundaries is how we drive progress in the industry. S

SOME OTHER TZCC 2024 WINNERS

ENDURANEST

Architect Ande Bunbury teamed up with Anna Womersley from Blue Banded Bee to design EnduraNest, the winner of the Victorian state award. The floor plan is designed to be divided easily into two two-bedroom units in the future without major building works. At 165 square metres, EnduraNest is a lot smaller than the 230 square metres of the average Australian new home, but due to efficient design, there is no compromise on features or functionality. The design makes for minimal circulation spaces, no dead corners in poorly proportioned rooms, fewer materials, less cost, less furniture, less cleaning and less maintenance. On the positive side, there's more garden, more comfort, and more time to do what you want.

HABITAT HOME

Habitat Home won the student award as well as the award for best use of organic materials. Energy assessor Greg Sparrius and his daughter, architecture student Pip Sparrius, based their design on meeting 'Three Ls': Long Life (a home built to last – delightful, healthy, and durable), Loose Fit (flexibility in design, allowing the home to adapt to changing needs over time), and Low Impact (a design that addresses the immediate climate crisis, offsetting its embodied and operational energy with maximum solar energy).