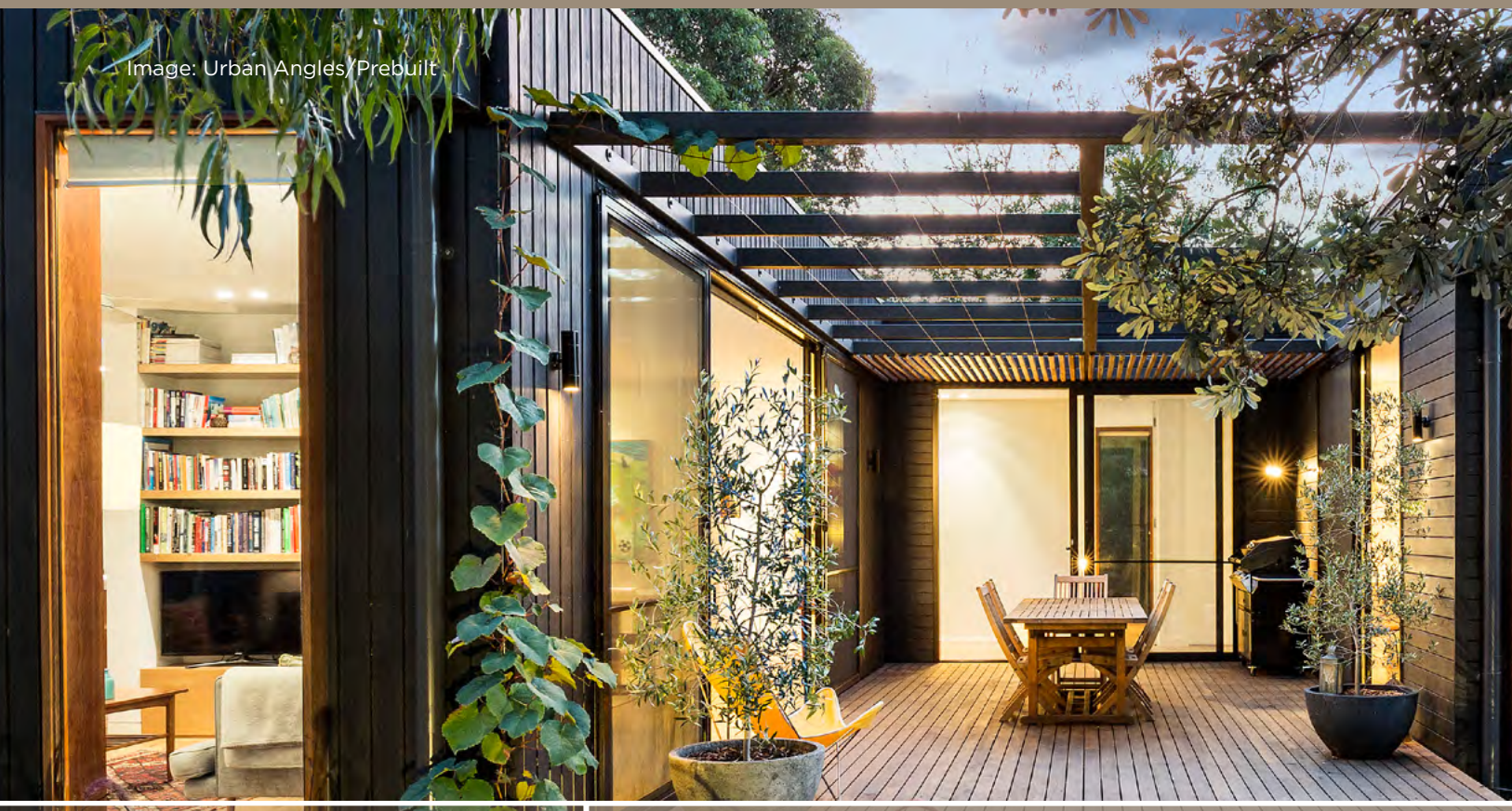


Image: Urban Angles/Prebuilt



Prefab power

OFFSITE CONSTRUCTION GATHERS PACE

WORDS Jacinta Cleary

The housing affordability crisis, inflation and a desire for an energy-efficient home in the face of rising energy bills have many people considering prefabricated and modular construction as a reliable solution. We look at what's new in the industry, and profile a range of local suppliers in our modular and prefab guide.

Just like another advanced technology, electric vehicles, prefabrication for residential buildings hasn't been fully adopted in Australia – yet. The tipping point might already be here though. Sky-high building costs and pressures in the housing market are forcing many people to look at alternatives to traditional ways to build a home, meaning heightened interest in prefabricated and modular construction methods for Australia's small but growing industry.

"The prefab and modular sector offers greater certainty than conventional construction," says senior associate architect Andrew Fotia from ARKit, adding that the industry is now sufficiently "well primed" with completed projects to be seen as a safe and reliable option. "People are spooked, worried that builders will go under in the current climate," he says, pointing to the collapse of prominent building companies this year. "They want to know how they can be sure they'll get a finished home, and with prefab's shorter construction time, there's less risk of things going off track."



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More and more prefab companies are offering panelised systems that are easy to transport and assemble, and make for a fully insulated building envelope that significantly reduces heating and cooling needs. Image: Zen Haus Group



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With a prefabricated approach, most of the construction work is done before transportation, minimising time spent onsite. Here, a module by Prebuilt is craned into position in Byron Bay, New South Wales. Image: Media Drive

Others say that a shift away from traditional 'stick-build' methods to more efficient prefabricated and modular systems is unavoidable. "The broader industry recognises that prefabrication is the best way to deliver the homes of the future," says CEO Burkhard Hansen of CarbonLite, makers of PanelLite, a wall, floor and roof panel system that can be used to assemble Passive House homes to lockup stage in a matter of hours. "Everything is working against the building sector in an era when demand for houses is increasing. Builders are under immense pressure, with soaring building costs and the constant battle to achieve a margin." He mentions one volume builder that recently moved their catalogue of homes to the PanelLite system, for reliable building costs and energy efficiency measures that meet the incoming 7 Star minimum standard. "Prefab offers a chance to build a house and be part of the energy solution at the same time."

Prefab's emphasis on sustainable processes and energy efficiency is an exciting prospect for homeowners. The suppliers in our modular and prefab guide (see p60-65) use sustainably sourced materials and innovative construction processes that

minimise waste; their homes also feature energy-efficient design, of course. “The end product is much better: it fits together better, lending itself to greater energy efficiency, with fewer gaps and more precise window openings. All of this contributes to the energy efficiency solution that conventional building keeps pushing to the side,” Burkhard says.

Suppliers we spoke to are building upon already streamlined systems, with further automation of construction processes to save materials and reduce labour and construction time while enhancing the quality of built projects. The team at Modscape spoke about their robotic production line used to manufacture open and closed wall units as well as Passive House-standard wall, floor and roof cassettes, while Ecoliv staff say they are exploring further efficiencies through a system that combines 3D CAD software and fully automated CNC equipment to produce buildings to lockup stage in shorter timeframes.

The list of companies that use either a panelised approach or a mix of panels and volumetric modules to construct a home has grown since our last prefab and modular supplier guide was compiled. Structural insulated panels (SIPs), prefabricated with insulation sandwiched between two durable cladding layers, are becoming more popular for their ability to minimise heat transfer and reduce heating and cooling costs. “We’re seeing an increase in customers looking at our Passive House prefab system for its energy efficiency, to protect against further energy price rises,” says Andrew at ARKit.

When it comes to design, many steps have now been taken away from early ‘cookie cutter’ prefab offerings. Companies are increasingly offering customised designs, a broader range of floor plans, or easy-to-adapt modular systems that can scale up or down to suit homeowners’ requirements. This flexibility is attracting customers across a range of budgets. “The benefit of prefab is that it can be customised and offered in various ways when it comes to layout and finishes. This makes it attractive to people with smaller budgets or building to difficult site conditions,” says Daniel Yip from MAKE Architects in New Zealand.

Lifting the quality of the designs in recent years, including in terms of climate responsiveness, is the growing involvement of architects in the design and planning of prefabricated and modular homes and systems. More companies employ architects or are run by architects branching out with their own innovations. Increased collaboration and knowledge sharing between manufacturers, architects, engineers and builders is improving construction techniques and elevating the overall quality of prefab homes.

Managing director Ed Callanan of FabPrefab says that these days there’s more demand for prefabricated and modular construction from a younger generation of home builders and renovators – where affordability allows. “They care about sustainability, and prefab reduces material use by up to 70 per cent while providing a thermally efficient home,” he says. “We’re also seeing more enquiries from people who’ve moved to outer urban or regional areas due to a lack of affordability in cities.”

One FabPrefab client, a first homeowner, planned to build a new home in regional New South Wales, but when the project went out to tender the build cost came back significantly higher than budget. “We tweaked the existing design a little, and used our system to hit the price they were after,” says Ed; the house was built in modules offsite using cross-laminated timber (CLT), then delivered and “plugged into” the site. Ed says that several factors, including material costs and shorter construction times, make prefab projects a more affordable option now. “We’re not so affected by timber shortages, because CLT is an engineered product and we can buy ahead and store it in our facility.”

It’s clear that the prefabricated and modular construction industry in Australia has made significant strides in the last few years. Market acceptance and government support is on the rise; just a couple of examples are Zen Haus Group’s selection to build prefabricated social housing in Tasmania, and the Victorian state government’s plan to roll out over 100 energy-efficient prefabricated homes for homeless people in regional areas. “The industry has established itself with forward-thinking processes, fast manufacturing and sustainable housing solutions built in a controlled environment,” summarises Ed.

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Manufacturing building components in the controlled environment of a factory, such as Eclipse Passive House’s Sydney facility pictured here, allows for high precision, efficiencies in material use and waste management, and greater certainty for timelines. Image: Evan Maclean

