

MODERN GREEN HOMES

# Sanctuary

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High-performing volume builds; garden design for mental health; responsible timber



**BUILDING A  
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## VOLUME-BUILT WINS: Steps to a more sustainable project home

WORDS Erika Bartak



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Having decided on a project home for their family's new house in Moonee Ponds, Victoria, environmental lawyer Rebecca Nelson and her partner Richard Smith did their research and chose to work with volume builder Henley as the company could offer in-house sustainability expertise and advice. The couple picked the home design best suited to their needs and block and made alterations including moving the laundry to the south side, removing walk-in wardrobes, and adding internal doors to help with zoning the house for heating and cooling. They also made changes to the materials for improved thermal performance and sustainability. Read the full house profile on page 52.

Image: Tatjana Plitt

**Volume-built homes (also known as project homes) are an increasingly familiar sight, appearing en masse in the new estates fringing our cities and towns, or popping up as replacement homes in established suburbs. Many people look to volume builders as an affordable option for their new home – but how do you achieve your sustainability goals with this mass-market product? ESD consultant and housing researcher Erika Bartak explains the easy wins, the pitfalls to avoid, and the important questions to ask at each stage for those wanting a sustainable volume build.**

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Melburnians Rebecca Nelson and Richard Smith wanted to build a sustainable home for their family, but after interviewing a few architects they quickly realised that a bespoke home that met their brief was going to be beyond their budget. Despite some anxiety about their reputation for producing 'McMansions', Rebecca started investigating volume builder options. The idea of working with the same company for design and construction was appealing for a busy family – as was the significantly lower price tag.

After browsing some volume builder websites and visiting a few display homes, Rebecca started talking to sales staff about her sustainability aspirations. Some showed interest, while others didn't seem to understand what she meant or why she would bother. She kept looking until she found the right fit, ultimately settling on a volume builder with the enthusiasm and experience to help the couple create the sustainable home they were aiming for. (See our profile of Rebecca and Richard's home on page 52 for details of what they achieved.)

Rebecca's aspirations would be shared by many *Sanctuary* readers: to build a home that is comfortable and healthy in a changing climate, with affordable running costs and a smaller environmental footprint. And we know that many home buyers do choose the volume builder path. According to the Housing Industry Association (HIA), the 100 largest home-building firms are responsible for roughly one third of all new dwellings: that's around 70,000 houses and apartments each year!

Volume homes have traditionally been known as big and cheap, hence the 'McMansion' moniker. But the good news is that more and more volume builders are embracing energy efficiency and sustainability performance, supported by a range of government and industry initiatives and growing consumer awareness.

## **VOLUME BUILD BASICS**

What exactly is a volume home builder? While there's no official definition, the term is commonly used to describe home building organisations that construct a significant number of dwellings each year, often from a 'catalogue' of standard plans and options.

In simple terms, the volume-built housing model operates on the principle of mass production with limited variations. This gives builders efficiencies of scale, helping them to keep costs down. Volume build customers typically choose their home from a suite of standard plans, often accompanied by

a limited palette of customisations such as facade designs. Each design will come with a range of 'standard inclusions', the specifications included in the base price of the home. Changes to standard designs and specifications typically attract additional costs, but these can sometimes be offset by the seasonal deals and upgrade offers that characterise the industry.

Volume-built homes are attractive to potential home buyers for a variety of reasons. Instead of working through the design process from scratch, you can pick and choose from a range of existing plans, finding and maybe adjusting a design that suits your needs. By visiting displays, you can experience a range of homes in three dimensions instead of just on paper, wandering through the spaces to get a good sense of the size, layout and materials (note that many builders have 3D virtual reality systems allowing an online 'walkthrough', which can also be useful). And thanks to the standardised process of design and construction, a price can be fixed upfront, avoiding the cost uncertainty of having a bespoke home designed and then negotiating with builders to construct it.

## **KEY STAGES AND CONSIDERATIONS**

### **Choosing your site**

Land selection is the first step for any new build. Whether you are rebuilding on your existing site or looking for land, the orientation of both the site and the house are the first things you should consider. "Good orientation doesn't cost anything extra, but it can have a huge benefit," explains Rod Fitzsimmons from Victorian volume builder SJD Homes. He recommends finding a plan "as close to 'solar perfect' as possible," so that the costs of changing windows and upgrading insulation can be minimised. Analysis from Sustainability Victoria's Zero Net Carbon Homes program backs up this claim. They found that a house's energy rating can vary by half a Star or more, simply by rotating it from its worst to its best orientation for passive solar performance. Changing your house position or room locations while the design is still on paper will cost very little, but the price of getting it wrong could equate to thousands of dollars in unwanted energy bills over the years once the house is built.

If you already live on the site where you want to build, you'll probably know the existing conditions well. Take note of the orientation, size and features of the site, and look out



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SJD Homes is one of the program builders for Sustainability Victoria's Zero Net Carbon Homes program. In 2018 they opened their first zero net carbon display home, the Zenith, demonstrating the company's "Z-Range" package for energy-efficient, high-performing homes. In addition to passive solar design, SJD worked closely with building performance assessors to ensure the airtightness and thermal performance of the building envelope, and the energy rating for the display home is 7.3 Stars.

for potential constraints like overshadowing neighbouring buildings. If you're looking for a block of land in a new estate, the same considerations are important, but might be harder to understand if all you can see is an empty patch of grass. Find out as much as you can about the surrounding future development, such as the likely height and proximity of any future neighbouring houses. Land affordability pressures mean new lot sizes are shrinking but houses are remaining relatively large, meaning more houses built close to each other. This can limit solar access and natural ventilation paths, not to mention the views you get from your windows.

Be alert to the location of driveways and utilities. These may seem like innocuous site features, but they can have a significant impact on your house orientation and performance. New lots often come with the vehicle crossover and energy and water services already installed, which can narrow the range of house plans that work with your site. Unless you're prepared to dig up and relocate these (at significant cost), the location of the street, driveway and garage often ends up determining the orientation of the house plan, for better or worse.

### Choosing a design

Choosing a house design is the logical next step, and for the reasons outlined above, it's highly recommended that you consider the house and land together. You'll need to find a plan that suits the needs of your household, including the obvious details like number of bedrooms, bathrooms and living spaces. Beyond these basics, you'll want to choose a plan that

works well with the opportunities and limitations of your site. Which direction will the living areas face? Are the bathrooms and laundry taking up valuable north wall space? Can you shuffle rooms or window openings around to improve access to sunlight, breezes and the garden?

The simplest way to reduce your environmental footprint and housing costs (both upfront and over the long term) is to build small. This can be a challenge in the volume build market, where ranges often start at three bedrooms, and the choice of small-footprint homes may be limited. Many websites include filters so you can browse home designs that suit your block dimensions and size requirements.

The builders I spoke to for this article were in vigorous agreement that in the volume building world, it's easier and cheaper to find a 'close enough' design that you can then tweak to suit, rather than making major design or structural changes. If you want to customise a design significantly, make sure you speak to the builders upfront to find out if they can accommodate such changes. Pricing will depend not only on the extent of the changes, but on how much each builder wants to facilitate – or deter – customisation.

As mentioned above, display homes are a defining feature of volume-built housing, and a great way to experience various house plans in 3D before you commit to one. They can give you a real sense of house size and room layout, as well as construction materials and interior finishes. But a word of caution: display homes are often upgraded with various 'bells and whistles' to attract customers and show off the potential of

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the design. They are unlikely to be built with only the standard inclusions, so it's worth asking for the price and details of the home as displayed, compared to the base version.

**Standard inclusions and performance upgrades**

It's important to understand the standard inclusions, and what these might mean for the comfort and performance of your home. This document specifies what is included in the base price, such as construction materials and insulation levels for the roof, walls and floors, window frame and glass specifications, exterior and interior finishes, plumbing fittings and fixtures, and installed appliances for cooking, heating, cooling and hot water. Remember, the volume builder model tends to emphasise standardisation and minimum compliance in order to keep their advertised house prices low. The standard inclusions will vary for each home design and builder, but it is common for entry-level specifications to include only basic insulation levels and single-glazed windows.

It does pay to look around for builders and developments that have specific sustainability targets or product offerings. While minimum compliance (6 Stars) is the usual starting point for volume-built homes, there are the occasional house designs or product ranges that promise higher energy ratings: 7 or even 8 Stars. Some new estates require above-minimum house energy ratings, or other sustainability measures like water efficiency, and the volume builders delivering homes there will have designs and upgrades to meet these targets. Sustainability Victoria's Zero Net Carbon Homes program requires a minimum house energy rating of 6.5 Stars, as well as energy-efficient appliances and rooftop solar PV. Its three program builders, Metricon, Stockland and SJD Homes, all offer zero net carbon homes and upgrade packs that are certified under the scheme. The Green Building Council of Australia's (GBCA) recently launched Green Star Homes Standard, part of its Future Homes Strategy, will certify houses that meet requirements for health, resilience and net zero energy. Keep

your eye out for participating builders.

Whichever builder you choose, once you've settled on a floor plan that works well with your site and orientation, consider what upgrades you'd like to make to the standard inclusions; beefing up the insulation and specifying double glazing are good places to start. Some builders prefer to double-glaze the windows while leaving larger doors single-glazed, but Frank Perconte from Burbank Homes suggests a different approach: "Double-glaze whole rooms, including the doors. If you can't afford to upgrade the whole house, start with the rooms you'll use the most, like living areas." He also points out that optimising window sizes is an easy way to improve your thermal comfort and energy rating: "Do all windows need to go right down to floor level? Raising sill heights can reduce the glass area and energy loss, reduce your upfront costs and improve flexibility by allowing you to put furniture under windows."

Note that volume builders have supply agreements with a range of manufacturers and providers, and they may not be able to accommodate that particular high-performance window supplier or heating system you've researched. Ask about any desired substitutions or upgrades as soon as possible to avoid disappointment down the track.

**ASSESSMENTS AND CERTIFICATIONS**

Regular *Sanctuary* readers will be familiar with the benefits of a house energy rating done early in the design process, to help you to make cost-effective decisions about window sizing, insulation levels and so on. But in the typical 'pipeline' of volume-built homes, the energy rating is generally completed after the design and specification decisions have been made, just before the home needs building approval. Find out whether you can add a preliminary energy rating to the process; some builders will accommodate this for an additional fee, and this modest investment upfront could help offset significant running costs in the long term.



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At their Orion community in Braybrook, Victoria, developer Stockland is offering the Apollo (left), a 'townhome' that is designed, built and tested for energy efficiency and comfort. 'As built verification' (ABV) assessments will be conducted on finished homes, including blower door tests and thermal imaging to check the airtightness and insulation integrity. At right, Chun Kit Cheung, technical director at building assessor Efficiency Matrix, runs a workshop for the construction team about the ABV process.



Another important step is as-built verification, that is, testing to demonstrate that what was designed on paper has actually been constructed. For example, the Zero Net Carbon Homes program uses thermal cameras and blower-door tests to check that insulation has been installed correctly and the appropriate degree of airtightness has been achieved. The Green Star Homes Standard requires as-built testing in order for homes to be certified. Even if your chosen home is not part of a specific scheme, some builders are willing to help out with independent testing. “Build tight, and ventilate right!” advises Adam Selvay from Henley, who has used blower-door testing to optimise airtightness and performance for a range of homes. This includes a growing number of customers incorporating mechanical ventilation with heat recovery (MVHR) into their designs. As Adam explains, these systems “provide the ultimate balance of energy efficiency, thermal comfort and health in a home, by gently providing a balanced supply of fresh, filtered, pre-conditioned air.”

## CONCLUSION

The common advice from both volume builders and their past customers is to “ask early and ask often”. The sooner you raise your sustainability objectives with potential builders, the earlier you’ll know whether they’re enthusiastic partners in your journey, or whether you should start looking elsewhere. Make a clear list of the goals you have for your home: A high energy rating? Water efficiency and recycling on site? A comfortable and healthy indoor environment? Enough solar panels to offset your annual energy demand? By having these conversations early, you’ll discover what can be accommodated within the volume home builder model.

For the most cost-effective outcomes, remember to target the ‘easy wins’. Finding a house plan that works well with your site, orientation and climate is half the journey. Make sure you understand the standard inclusions, and what options are available to upgrade or improve these. And talk to your builder about futureproofing: making allowances for things they don’t offer or you can’t afford now, so they can easily be added later.

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Metricon’s Delta 29MR display home at Kaduna Park Estate in Officer, Victoria, has been built to Sustainability Victoria’s Zero Net Carbon specifications, including increased insulation and draught sealing, double glazing and a solar PV system as standard. Metricon offers Zero Net Carbon energy efficiency upgrade packages to customers in Victoria. There are also energy-saving inclusions available to customers in Queensland, New South Wales and South Australia.

Good examples of this include electrical wiring for future electric vehicle charging or battery connection to your solar PV system, and sufficient structure so that you can install your own external blinds or pergola down the track.

And of course, it pays to do your research and keep your eye on builder websites. House designs, product ranges and upgrade offers change frequently, and you just might find that your perfect plan now comes with an energy upgrade pack or a great solar PV deal. Consumer awareness and demand for sustainable options, and corresponding momentum in the volume home building sector, are growing. With a bit of initiative, you’ll be able to achieve a more comfortable, healthy, resilient and affordable volume-built home. 📍

## ABOUT THE AUTHOR

Erika Bartak is an ESD consultant and sustainable housing researcher with a background in architecture, and a passion for designing and promoting better housing. She is currently completing her PhD at the University of Melbourne, investigating energy efficiency in the Australian volume home building sector. She is also engaged as a house energy rating consultant for Sustainability Victoria’s Zero Net Carbon Homes program.

## RESOURCES

Green Building Council of Australia’s Green Star Homes Standard and Future Homes Strategy  
[new.gbca.org.au/rate/green-star-strategy/green-star-homes](https://www.gbca.org.au/rate/green-star-strategy/green-star-homes)

Sustainability Victoria’s Zero Net Carbon Homes pilot program  
[sustainability.vic.gov.au/About-us/What-we-do/Campaigns/Zero-Net-Carbon-Homes-Program](https://sustainability.vic.gov.au/About-us/What-we-do/Campaigns/Zero-Net-Carbon-Homes-Program)

COAG’s Trajectory for Low Energy Buildings  
[coagenergycouncil.gov.au/publications/trajectory-low-energy-buildings](https://coagenergycouncil.gov.au/publications/trajectory-low-energy-buildings)

Proposed changes to the National Construction Code  
[abcb.gov.au/Initiatives/All/Energy-Efficiency](https://abcb.gov.au/Initiatives/All/Energy-Efficiency)