

# Sanctuary

MODERN GREEN HOMES

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SUSTAINABLE HOUSE  
DAY SPECIAL

KEEN ON GREEN

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eco homes on show

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## ASK THE EXPERTS: Living in a Passive House

WORDS Talina Edwards



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Chris and his family built a Passive House in suburban Sydney designed by Envirotecture; he says that he appreciates knowing that his wife and young children have a safe, healthy and comfortable home to live in. Image: Jonathan Cohen Photography

**Passive Houses tick a lot of boxes, but what are they actually like to live in? The team at the Australian Passivhaus Association surveyed Passive House residents for some answers.**

Originating as Passivhaus in Germany, the Passive House building standard is gaining huge momentum in Australia – for good reasons! Over the last few years in particular, lockdowns and increased working from home arising from the Covid pandemic have shone a spotlight on poor comfort in many homes, in addition to inadequate ventilation strategies in most buildings that can have negative impacts on our health.

## WHAT'S INVOLVED IN BUILDING A PASSIVE HOUSE?

The robust criteria of the Passive House standard ensure that the following are addressed during the design stage, and verified after construction is completed:

- Continuous insulation to roof, walls and floor
- High-performance windows and external doors that are well sealed (double- or triple- glazed, depending on climate)
- Airtight construction to enable better control of indoor temperature and humidity levels – tested with a blower door test to reach 0.6 ACH50 (air changes per hour at 50 pascals pressure) or less

- An appropriate ventilation strategy to allow continuous fresh filtered air – mechanical ventilation with heat recovery (MVHR), also known as heat recovery ventilation (HRV)
- Minimal thermal bridging in the construction (to avoid unwanted external temperatures transferring inside the building envelope)

This is achieved using thermal modelling during the design stage with the Passive House Planning Package (PHPP) software.

For more on the Passive House standard, see 'Mind the gaps: Passive House from the inside' in *Sanctuary* 45.

Building to Passive House standard is one approach to addressing this, and *Sanctuary* has showcased many certified Passive Houses as more homeowners are deciding to venture down this path, creating homes that are not only beautiful and energy efficient but also have the quality assurance of comfort and healthy indoor air quality.

The Australian Passivhaus Association (APHA) is a not-for-profit organisation whose goal is to raise awareness of the benefits of the Passive House standard, and help inform the community and educate the industry to deliver more of these buildings.

### ASK THE HOMEOWNERS

In this article, the team at APHA reached out to a group of homeowners who all live in certified Passive Houses, to ask for their responses to some frequently asked questions. To those in the know, some of these answers are probably not that surprising ... which is also excellent proof that these homes are performing as expected! First up, we asked:

#### How do you describe what it is like to live in a Passive House to someone who doesn't know?

*"In one word: comfortable. The temperature doesn't fluctuate much, it's quiet because of all of the insulation, and it just feels solid and peaceful."* – David (central Victoria)

*"I talk about how amazing it is to live in such a healthy, mould-free, dust-free, naturally temperature-controlled environment."* – Prateek (central Victoria)

*"To be honest, when you're busy with everyday life, living in a Passive House is not much different to living in any other house – there is no extra 'work' that you need to do, or things you need to know. It's easy because it's just almost always comfy to be in."*

*"When there is extreme weather outside, the house feels like a cocoon ... a soft, safe, sheltered place."* – May (suburban Sydney)

*"No matter what the climate outside is like, the house maintains a comfortable temperature of 20 to 23 degrees with very little energy use. I have got used to such comfort and, when I visit other houses nowadays, I am often shocked at how uncomfortable normal Australian houses can be. I would find it hard to live in any other kind of house."* – Rodney (southern Queensland)

*"Living in a Passive House is just like living in any other house, only more comfortable and affordable, and we have to check the weather to dress appropriately for outside. We live about 30 metres from a major train line, but the noise is barely noticeable."* – Matthew (suburban Sydney)

*"In winter my skin doesn't dry out from excessive heating, and I have got very happy indoor plants!"* – Monica (suburban Melbourne)

*"It's always a comfortable temperature inside. There is always fresh air to every room. It's delightfully quiet. There is never a feeling of stuffiness or excess humidity. There are no cold surfaces in winter. There is no condensation, damp or mould. There are no ants, cockroaches or insects (another great benefit of airtightness). I have the great satisfaction of knowing my wife and three young kids have a safe, healthy, comfortable home to live in."* – Chris, in suburban Sydney (Thank you, Chris, for highlighting the health benefits. There's been plenty of media attention recently on the poor state of many of Australia's homes, causing health issues for their occupants. There's a better way to build to avoid these issues, and when building or renovating is such a huge investment it pays to get it right from the outset!)

Next, we asked:

**Do you find you are opening your windows more or less frequently than expected?**

There is often confusion when it comes to what ‘airtight’ construction actually means, with many people assuming that in a Passive House you can’t open your windows ... so let’s get this cleared up. As it turns out, respondents’ preferences about open windows varied a lot – and in a Passive House, that’s fine.

*“We open windows less frequently than expected: the mechanical ventilation means that there is always fresh air flowing and the house doesn’t get stuffy, so in winter there’s really no need to let in the cold air. In the summer, we often rely on air conditioning (powered by solar) during the day but open the windows in the evenings and overnight to cool down the house while we sleep.”*  
– Jen (suburban Melbourne)

May agrees: *“Much less frequently – we used to have windows open all the time as some in the family enjoyed having a cool breeze. Nowadays we generally keep windows closed and a cool breeze (if desired) is provided by the ceiling fan. We do open the windows upstairs on summer evenings, to purge heat when the outdoor air temperature is lower than it is inside (we determine this through the scientific method of opening the window and seeing if it feels cooler) – and also when we’re having a hot bath on a cold stormy night, so we can hear the storm better!”*

*“I open the windows less than in my old house in the suburbs, which means far less dust, less cleaning and greatly reduced noise factor. If I want to cool the house I just open opposite doors for great cross ventilation. However, summer can be a little challenging, so external awnings could provide further indoor comfort. I absolutely love the calm feeling in my non-linear home.”* – Bianca (regional Victoria)

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Certified Passive Houses feature discreet plaques like this one on Enviroecture’s Thornleigh Passive House in Sydney. Image: Brandee Meier



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Jen’s family’s rammed earth Passive House in outer suburban Melbourne was designed by Maxa Design. She says that they open their windows less frequently than they expected to because the mechanical ventilation system means that there is always fresh air flowing and the house doesn’t get stuffy. In summer, they open the windows overnight to cool down the house while they sleep. Image: Chris Neylon

Chris explains further: *“In our old house, we would close doors and windows when we had heating or air conditioning on, then have to walk around and open them all to ventilate the house when we were home and the weather was fine. Or we’d leave windows open, and the house would overheat or get too cold, then we’d have to close them all to get the temperature relatively comfortable. It was a daily chore. In our Passive House, the ventilation system continuously provides fresh air to every room and extracts stale air from the kitchen, bathrooms and laundry. There is always fresh air, so you don’t feel the need to open windows for ventilation. I open the window when I’m working in my study on a nice day, to hear the lorikeets and feel the breeze. But I don’t have to open it to feel comfortable or avoid a sense of stuffiness.”*

*“We open our windows about the same amount we did in our old house. We like open windows. Our windows are closed all winter and during summer days, but we open them nearly every summer night and often on spring and autumn days. When the weather is nice we open the windows, but when it isn’t we keep them closed. The big difference is that we still have fresh air in our house when the windows aren’t open.”* – Matthew

Peter (outer Melbourne) says: *“We open our windows more than we expected. Windows remain closed during colder periods and in extreme heat, but otherwise may well be opened to connect with outside conditions, sounds and fragrances or to feel natural airflow.”*



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Rodney's Passive House, designed by David Halford, is in southern Queensland. He loves that it maintains a comfortable interior temperature of between 20 and 23 degrees all year round, with very little energy use. Image: Rodney Insall

And for our final question:

#### **Why did you choose to certify your Passive House?**

All respondents agreed it was a worthwhile exercise, with Matthew summing it up: *"Building any house is a huge investment; building ours was the biggest investment of our lives. Passive House is a performance standard, and having the house certified meant having an expert verify that the designer and builder had designed and built the house we had paid for! The cheapest insurance I've ever purchased and worth every cent."*

Jen said: *"We did it mainly for peace of mind that the build was working as expected. We did toss up whether it was worthwhile to proceed with the certification, but after going through the whole process it made sense in the end to complete the final step."*

*"To get an additional level of confidence that all of the benefits of a Passive House have actually been delivered and, to be perfectly honest, for resale value."* – David

*"So the builder and trades people are held accountable for their work. I have a guarantee that it's a Passive House."* – Monica (whose husband built their home)

Chris shared: *"I'm a big believer in the value of certification. It means that independent experts have checked and verified that my house meets the required standards of energy efficiency. Without certification, how would someone considering buying or renting this house in the future have any confidence that it was any better than a house built to the minimum standards of the building code? They can't see the insulation or the airtight membrane, or the quality of the sealing, or the careful structural detailing and high-performance window frames and spacers that avoid thermal bridge effects. Certification means a buyer or tenant doesn't have to take my word for it; I can prove that this is a great house, a sustainable house that is super-efficient, amazingly comfortable and healthy. I installed the plaques by the front door, because I'm proud of the technical excellence that they represent, but also because it will increase the value of the property to any future owners."*

#### **MORE INFORMATION**

If you'd like an opportunity to visit a Passive House and experience the difference yourself, be sure to keep an eye out for Sustainable House Day ([www.sustainablehouseday.com](http://www.sustainablehouseday.com)) and regular International Passivhaus Open Days. Find out more at [www.passivhausassociation.com.au](http://www.passivhausassociation.com.au), where you can also grab your free copy of the APHA's book *Passivhaus in Australia*.