



Climate ready

After three wet summers in Australia, the forecast has shifted to hot and dry. Jacinta Cleary reports on how to save money, stay comfortable and keep cool at home and in the community this summer.

Image: jandrielombard, iStock



Ideally, homes are well-insulated and draft-sealed before running air conditioning units all day long, especially if no-one's home.



While Greece burned and the Mediterranean baked in a July “heat attack”, Australians wondered what might unfold back home this summer. As some people rethink a future holiday to Southern Europe at the height of summer, and their carbon miles in the face of climate change, it's also time to prepare our homes for the challenges that a dry, warm El Niño summer might bring.

With not much money to spare and limited time before warmer weather hits, what actions will be most effective for households looking to beat the heat, reduce energy use and lower their energy bills this summer? Talina Edwards, architect and director at sustainable design practice Envirotecture, says that while summer is fast approaching, households should continue to find sustainable ways to reduce energy use and CO₂ emissions when keeping cool.

“This is a timely reminder that we are in a climate emergency and need to be taking action wherever we can to reduce carbon emissions now for the wellbeing of people and the planet,” she says.

“Considering the big picture, any new buildings must be designed appropriately to be future-proof and reduce the need for later retrofits and upgrades. However, there's a lot we can do to improve our existing homes

too, whether you have funds for making big improvements or are on a budget or renting. Cost-effective solutions like shading and draught proofing will make a difference. Then, consider upgrading insulation before installing air conditioning.”

Meanwhile, community groups are warning about the health and social impact of hot weather, urging households to prepare their homes and make heatwave plans. “Housing can keep people safe from summer heat, however many people in Australia live in low-quality homes that deny them protection from heat,” says Sweltering Cities Executive Director Emma Bacon.

What's in store this summer?

Australia was put on alert in July when the World Meteorological Organization (WMO) declared an El Niño event was underway. “The onset of El Niño will greatly increase the likelihood of breaking temperature records and triggering more extreme heat in many parts of the world and in the ocean,” said Petteri Taalas, the WMO secretary-general.

The US, Japan and Australia each have slightly different metrics for monitoring and declaring the weather pattern over the tropical Eastern Pacific Ocean that triggers the warming El Niño and cooling La Niña. In September 2023, the Bureau of Meteorology

finally declared that an El Niño weather event was underway in Australia for the first time in eight years.

The hot and dry forecast leading into summer gives a high chance of below average rainfall for the eastern half of Australia and southern WA, and above average maximum temperatures very likely for most of Australia.

“We face a dramatic season ahead ... things continue to unfold, but Australia being the most vulnerable nation in the developed world makes us really on the frontline of the impacts of climate change,” said Dr Joelle Gergis in *The Saturday Paper*.

El Niño and climate change

Climate scientist and Climate Council representative Professor David Karoly says that the El Niño Southern Oscillation, a natural cycle that occurs every eight years or so, can have a dominant influence on Australia's climate. El Niño is associated with warmer than average temperatures in the equatorial Pacific and leads to dry conditions, droughts and much warmer than average temperatures across eastern Australia. The last El Niño in 2015-16 brought various climate extremes such as drought, heatwaves and bushfires. Coupled with climate change, El Niño's effect can be exacerbated, he told the Climate Council.



"For these sorts of events like El Niño and La Niña, they have a typical lifetime of only about one year, so you can go from droughts associated with El Niño to flooding rains associated with La Niña. The impact of climate change on these natural modes of variation is to amplify their impacts. Climate change is happening in conjunction with or on top of the natural climate variations like El Niño and La Niña in the Pacific Ocean. Climate change is amplifying the water cycle so that wet periods, wet seasons get wetter and dry seasons and droughts get drier."

Passive summer cooling 101

It's been three wet La Niña summers since the Black Summer of 2019/20, enough time to let the shade sails down and get out of practice in extreme heat. Architect Talina Edwards says it's "easy to forget how a house works" and has plenty of reminders for people before they reach for the power button.

Improving roof insulation will have the biggest effect on comfort and bills. If that's not possible, Talina's number one tip is to use external shading to reduce heat gain in the home. "You want to try to keep it comfortable inside and keeping the sun off windows is the single most important thing you can do in summer. It gets forgotten and it's the most basic thing."

External shade can be cheap and easy to install for households under financial pressure from interest rates and rising energy bills. Bamboo blinds, shade sails and even blankets covering a wall or window can help keep the heat out. Closing the internal blinds can be a "next best" option if there's no shade outside the windows, but not as effective.

"Insulated roofs and appropriate eaves can keep out the hot summer sun that is directly overhead in the middle of the day, which is why we talk about the importance of light-coloured roofs and having a well-insulated home," Talina says.

She adds that horizontal eaves on the north facade are perfect for shading from summer sun in the middle of the day, however the east and west sides of the home do best with vertical blinds or screens. "Fixed eaves are not as effective later in summer when close to equinox and the sun is lower in the sky, a problem that is increasing now with climate change and longer summers," she says, noting that motorised blinds for vertical sun protection are becoming more common on her team's building and renovation projects to help prevent homes from overheating.

East- and west-facing walls and windows receive more summer sun in the early morning and late afternoon when the sun is lower in the sky, so vertical options such as

blinds, screens or plants can provide the most sun protection on these sides. It's especially important to protect west-facing walls and windows from afternoon heat. Extending awnings or blinds along an entire wall can be expensive, so consider shading with greenery (bamboo in pots is a fast option) or something as simple as a length of shade cloth attached to the gutter with bulldog clips. If a deciduous shade tree or vine needs some attention, now is the time to do it.

Talina says another forgotten passive cooling tip is to open the house when the outdoor temperature drops below the indoor temperature, or to do a night purge of hot air by opening opposite windows and doors for air flow, if security or insect-proofing allows. Now is the time to fix broken flyscreens and doors in the lead-up to summer.

"We have to continue to make decisions to reduce the impact of greenhouse gas emissions on our planet, and the increasing detrimental effects of the climate emergency," says Talina, urging people to watch their energy use to prevent blackouts and electricity shortages.

"Ideally, homes are well-insulated and draught-sealed before running air conditioning units all day long, especially if no-one's home. Your home needs to be able to hold the cool air in, otherwise you're wasting energy and money as it all leaks out.



Enviroecture
Thornleigh passivehaus
Image: Brandee Meier



Art: Josephine Ford

"Making these improvements will mean you need much less cooling, and it will be more cost-effective to run—if it's powered by renewable energy then this is even better. If you're unable to make these upgrades to the building fabric first, then only run your aircon when you're at home."

Early Christmas presents

Talina and other experts agree that a reverse cycle air conditioner is a very efficient form of heating and cooling that can be used all year round to keep healthy and comfortable temperatures inside the home. "Landlords can make a big difference to a tenant's comfort by installing insulation and an energy efficient reverse cycle air conditioner before summer," she says. "If money is tight, even a small, affordable split system can help create a cool retreat in one room of the house, with the bonus of it being a very efficient heater come winter, too!"

Where else is money best spent for maximum effect this summer? For those with a smaller budget, ceiling or portable fans help create a cooling effect through the evaporation of sweat and are cheap to run.

Fans combined with a misting system can be as cooling as an aircon in dry climates, although ceiling fans with built-in water misting systems are more commonly designed for outdoor patios and decks. Water droplets absorb heat as they evaporate, which cools the surrounding air to make the space feel more comfortable on hot days.

For a similar effect indoors, place a wet cloth or a bowl of ice water in front of a fan for DIY evaporative cooling. In saying that, it needs to be remembered that producing ice requires refrigeration, which uses electricity, which adds heat to the home. The more any appliance runs, the more heat is produced. Ultimately, all energy used by appliances turns into heat. An evaporative humidifier can also

help add moisture to indoor air and create a cooling effect in hot and dry conditions.

Recent memories of smoke pollution from the Black Summer bushfires will make some households concerned about air quality this summer. While some people with respiratory conditions used air purifiers during the Black Summer, a recent CSIRO study has confirmed that portable air purifiers fitted with high-efficiency particulate air (HEPA) filters can substantially improve indoor air quality during bushfires.

"Staying inside and closing windows and doors during extreme smoke events is important, but ultimately what provides protection against smoke pollution indoors are air purifiers fitted with HEPA filters," says lead author Dr Amanda Wheeler. Houses with a tighter envelope are more efficient in stopping the infiltration of outdoor smoke; even more reason to draught proof a home before summer.

Solar and battery households

Households can maximise their solar use during peak generation hours by using a smart thermostat to remotely control cooling systems, if they live in an insulated home that can hold the cool air. "Usually, summer solar generation is well above what you can use unless you have giant aircons. To maximise use, shift loads to the middle of the day, including water heating, pool pumps and air con pre-cooling," says *Renew's* technical editor Lance Turner.

Otherwise, there's no need to do anything to PV panels before summer except clean them and cut back shading trees, according to Lance. "Panels are designed for high temperatures, but they fare better when the surface is insulated evenly. Shade causes cool spots which can increase internal stresses in the panels."

As for batteries and hot weather, Lance says they should have their own internal thermal control systems. "They shouldn't be mounted in direct sun, but if they are then a sunshade of some type is a really good idea, as is the case for solar inverters mounted outside."

Solar and battery households

Creating a cool and comfortable sleeping space during hot weather is important for our health, especially for the elderly or people with health conditions.

Talina Edwards says that if possible, consider relocating to a cooler room in the home for sleeping in or for shelter throughout the day in a heatwave. If your bedroom is upstairs on the west, relocate downstairs to the south or to an insulated part of the house, or to a room with a window that gets the evening breeze.

Cool communities this summer

One group addressing the health, social and financial impact of heatwaves is Sweltering Cities. "After three years of La Niña when we had hot, but not record-breaking summers, I think this summer's going to be a real shock for people. We've had the hottest July on record, and we should expect more extreme heat records to fall over the next few months," says Executive Director, Emma Bacon.

With one in three Australians living in rental properties, the heat shock might be greatest for tenants spending the first summer in their house. "There'll be people who've recently moved and never gone through a really hot summer in the place they're living in now. How hot does your

Preparing for bushfires

Climate change and the generally hotter and drier conditions in play from the El Niño-like weather has communities worried about bushfires this summer. The Seasonal Bushfire Outlook released by the Australian and New Zealand National Council for fire and emergency services (AFAC) warns of an "increased risk" of bushfires this spring, with the summer bushfire forecast due late November.

The report notes that "Australia's climate influences have shifted significantly since last spring" and the move away from wet La Niña weather, with increased fuel growth in many regions due to above average rainfall of recent years.

For immediate information about property maintenance, emergency kits and how to write and share a bushfire plan for the coming season, go to the fire authority website in your state. The Country Fire Authority (CFA) Bushfire Survival Planning template is a good place to start: bit.ly/CFA-TBP

Community group Bushfire Resilience formed in response to the Black Summer bushfires and delivers practical, helpful and relevant webinars on how to get ready for the bushfire season. The Resource Hub on their website includes around 20 webinars delivered since 2020, including a series delivered in 2023, covering topics such as bushfire risk in a changing climate, reducing house and property risk and preparing pumps, tanks and sprinklers.

Emergency management leader Craig Lapsley oversaw the Victorian government response to the 2009 Black Saturday bushfires and urged households to check their insurance ahead of the bushfire season at a recent 'Getting ready for an El Niño summer' webinar for Bushfire Resilience. "Don't underestimate the insurance side of bushfire preparation. Read your insurance policy and make sure you speak to your broker or insurance company about the extent of your policy.

"One of the key things about being resilient is being insured—the financial side of resilience is really fundamental for how you get through a bushfire period. It's not a last-minute thing, it's something that must be thought through," he says. Visit Bushfire Resilience for webinar recordings: bushfireresilience.org.au/resource-hub

While the adjacent article talks about using passive solar to prepare for heatwaves, *Renew's* Green Rebuild Toolkit shows how thermal performance is also needed for bushfire safety and is an excellent resource for anyone building or retrofitting for long-term climate and bushfire resilience.

The Toolkit article, by Dick Clarke, 'Designing for both bushfire resistance and thermal performance' discusses the interconnect between passive solar design and bushfire resistance in more detail. "The provision of high levels of insulation—especially including the glazing—helps with resistance to radiant heat if a fire threatens. Less obvious but just as important is ember resistance, which aligns nicely with draught proofing. Sealing up cracks and openings will do both jobs well, although compliance with AS 3959 will require more attention and tight detailing to parts of the roof and subfloor that would not affect draughts."

Visit the Green Rebuild Toolkit website to read this and other climate resilience articles: bit.ly/GRTK-DBT



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house get overnight? How much does it cost to run the air con, and what can you do to reduce your running costs? These are things to think about before the first heatwave hits."

The organisation is calling on landlords to make properties "as heat safe as possible" through draught proofing, insulation installation or repairs, energy efficient reverse-cycle air conditioners and simple measures such as repairing fly screens for ventilation. "For a lot of people, adding some insulation, double glazing, or even just installing better blinds can improve their comfort over summer. Property owners should have a duty to provide safe housing in environmental disasters, and if that's a minimum that people aren't willing to meet, then they should reconsider their investment."

Emma says community initiatives, such


as the establishment of cool, safe spaces, can help protect vulnerable people from extreme heat. "It can be unsafe for some people to leave the house on hot days due to health issues, but people are still going to do it out of necessity," she says.

Sweltering Cities 2022 Summer Survey found that 50% of renters were leaving their homes to go to cool spaces such as shopping centres on hot days, compared to 15 per cent of homeowners, however some respondents said shopping centres were "a horrid alternative to a hot home".

Community group Moonee Valley Sustainability is upgrading their Ascot Vale headquarters in Melbourne's north-west into a cool, safe space. "We want to provide a refuge for the most vulnerable members of our community to use during periods of extreme heat, especially overnight when high temperatures are quite dangerous to human health," says Logan Shield from the organisation.

The first stage, the installation of a shade sail to cover the western wall and windows has been completed, with plans to increase thermal efficiency with insulation, double glazing and draught proofing, along with a future 20kW solar PV system to cover electricity use. The group hopes that the pilot project this summer will help more of these spaces be established.

Sweltering Cities is asking that people check in on each other this summer, with isolation one of the biggest risk factors for heat related illness and death. "Think about who you're checking in on, whether it's friends, family, people in your network, people you see in your neighbourhood. The real tragedy with heat is that isolation is a big killer as people don't necessarily feel themselves getting sick."

"We need to make sure that especially vulnerable populations like older people, people with disabilities or on low incomes, and homeless people, have a touch point this summer," she says. 

Resources

Climate Council: climatecouncil.org.au/category/extreme-weather

Your Home shading information: yourhome.gov.au/passive-design/shading

Green Rebuild Toolkit: greenrebuildtoolkit.com

Sweltering Cities: swelteringcities.org

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Jacinta Cleary has worked on various publications in the sustainability sector and has been giving passive cooling a go since her days as editor of Renew magazine.

Getting ready for heatwaves

Talina Edwards from Envirotecture says to focus on passive cooling first when preparing for heatwaves this summer.

Passive cooling: Keeping yourself cool on a budget

- Exclude summer sun during the day with external blinds, pergolas and shade-mesh
- Keep out direct sun and hot air
- Use cross ventilation, stack ventilation and night purging for cooling
- Sleep in cooler parts of the house
- Take short cool showers or apply wet towels to face
- Sleep with a damp cloth
- Don't cook a roast!
- Drink water—stay hydrated!

Passive cooling: keeping your home cool

- Upgrade insulation—not just for winter! Roof first, then walls, then floors
- Draught seal gaps
- Fit external blinds
- Shading on the north—horizontal eaves overhead
- Shading on the west/east—vertical screens/blinds
- Plan ahead and plant deciduous trees or vines
- Windows—follow Australian Glass & Window Association (AGWA) guidelines to choose the right glazing or reflective coatings for the right climate zone.

Active cooling: for this summer and beyond

- Use portable fans and ceiling fans
- Install an efficient reverse-cycle air conditioner
- Install a solar PV system or buy GreenPower from the grid to run aircon
- Consider mechanical ventilation (MVHR) with both heat-recovery in winter and coolth-recovery in summer. MVHR can have dehumidification for hot-humid climates.

Bigger picture: cooling the planet

- Make decisions to reduce your impact on the planet, and the effects of the climate emergency
- Reduce CO₂ emissions and get off gas
- Avoid grid overload—find community places where you can keep cool
- Avoid power-hungry tasks during the day—no ovens!
- Avoid the heat island effect—plant more shade trees, avoid black roofs, add more permeable surfaces and less bitumen.

Rosedale Beach House by
Thomas Caddaye Architects,
photograph by Ross Caddaye.

Beyond BAL

Examining bushfire resilience

As part of our ongoing work to support communities rebuilding after bushfire, Renew is profiling homes that go beyond the best practice specified in the complicated and variable Bushfire Attack Level (BAL) rating system.

The Black Summer bushfires destroyed 5,900 buildings and homes. Nearly three million people saw their homes damaged or threatened, or were temporarily displaced.

The Green Rebuild Toolkit is a set of online resources developed by Renew to help people rebuild their homes and increase resistance to future climate disasters. Now in its second phase, the Toolkit has expanded to include case studies of Australia's most bushfire-resilient homes.

As part of this research, Renew invited architects, designers and homeowners to submit designs for consideration, and worked with bushfire expert Nigel Bell from ECODesign Architects to assess them on three criteria: cost, sustainability and bushfire resilience.

We will be discussing these homes in four free online events, featuring homeowners, architects, designers, and bushfire experts. With plenty of time for Q&A, it's a great chance to learn more about improving the bushfire resilience of your home or future build. Book now:

13 NOV, 6:30PM-8PM
(AEDT), FREE, ONLINE

Budget-friendly
bushfire resilient
homes



20 NOV, 6:30PM-8PM
(AEDT), FREE, ONLINE

Innovative
bushfire resilient
homes



27 NOV, 6:30PM-8PM
(AEDT), FREE, ONLINE

Earth-coupled
bushfire resilient
homes



4 DEC, 6:30PM-8PM
(AEDT), FREE, ONLINE

High vegetation
risk bushfire
resilient homes



Save time and
book a free series
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