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ECO RENOS

RENOVATIONS LARGE AND SMALL CAN MAKE YOUR HOME A MORE ECO-EFFICIENT, HEALTHIER AND HAPPIER PLACE. SIMON WEBSTER FINDS OUT HOW.



Luke Middleton, director of Melbourne design firm EME Design, knows what a challenge it can be to eco-reno an existing dwelling, having converted a heritage house in inner-city Armadale into an eco-home built with high passive house standards. The result – a project called the Passive Butterfly – is a multiple award winner, with accolades including ‘Best of the Best’ in the 2018 Sustainability Awards. The design follows Passivhaus, a German standard based on passive solar design but with an emphasis on creating

TOP: THE ‘BUTTERFLY’ ROOF HAS BEEN DESIGNED TO LET WINTER LIGHT INTO THE HOME AS WELL AS THROUGH TO THE BACK GARDEN. ABOVE: THE DESIGN FOLLOWS THE GERMAN PASSIVHAUS CONCEPT.

an airtight space, ventilated with what’s called a mechanical heat recovery ventilation unit. This low-energy device allows outside air in but heats or cools it en route, producing comfortable temperatures with no drafts. It also has a bypass option if outside temperatures are ideal. Luke says you’ve always got good-quality air, especially in winter: “It’s like having the window open without losing the heat.”

PHOTOS: PASSIVE BUTTERFLY: AMORFO; HOBART HOUSE: GREEN DESIGN ARCHITECTS

Sealing off the existing “wonky” heritage property was a tricky process that involved replacing windows with triple-glazed units, and tearing off plaster to insulate walls. For an extension to the south, Luke plotted sun angles and designed an asymmetrical butterfly roof – two skillions with the low point in the middle – that not only allows winter light into the home to warm the internal rammed-earth walls, but lets it sneak over the low point of the roof and hit the small productive garden in the backyard, too. Other features in the renovation include high levels of insulation, low VOC paint (there are plenty of natural options these days), external blinds on doors and windows where necessary, a hot-water heat pump and two underground rainwater tanks and greywater supplied to the garden. A 5kW solar photovoltaic system produces 160 per cent of the home’s electricity needs, allowing the owners to charge their electric car at home and still have power left over to feed into the grid. This is a high-end reno, but Luke insists by architectural standards it wasn’t a particularly expensive one.

Permaculture thinking
Not everyone has the money to hire an architect to help design their new home or to do a full renovation. If you’re planning your own eco-makeover on a budget, Luke says it pays to take a permaculture approach. “It starts with observation,” he says. “Make sure you know where the sun rises and sets, look at the orientation of the building and factors such as neighbours. Where are the windows getting too much sun in summer and where are you not getting enough sun in winter?” “You can then work out how to add more windows, or shade the ones you’ve got – you might adopt a landscape solution such as planting a deciduous trees to the west to shade out afternoon summer sun.”

Uta Green, director of Tasmanian architecture firm Green Design, says it is not difficult to install overhangs and cross-ventilation to improve liveability. “Cross-ventilation just means having windows in more spots than one, ideally on opposite sides of the house.” If you’re renovating on a budget, Uta recommends starting with ceiling and floor insulation (walls can be tricky to access) to get the most bang for your buck, and replacing windows with double-glazed units. Luke recommends getting these things right before you start investing in technology. A draught-free, insulated home may need a smaller solar photovoltaic system to be carbon neutral than a draughty home with high heating needs. Other hardware that can make your home more efficient includes water tanks, greywater systems and solar or heat pump hot-water systems.

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HOBART HAVEN

This South Hobart home was renovated and extended to bring in light, capture views of Mount Wellington, improve flow from house to productive garden, and boost the home’s energy performance. Features include passive solar design, ceiling, wall and floor insulation, double-glazed, timber-framed windows, rainwater tanks, reused timbers for kitchen joinery, evacuated tube solar hot water, and solar photovoltaics. “We lifted it from a 2-star to 6-star house, and the extension is 8 stars,” says architect Uta Green. “It rarely needs heating.”

The happiness factor

Uta says that when you’re weighing up costs, it’s important to consider benefits beyond payback periods and power bills. “If you get your car tuned or buy a TV, nobody asks, ‘When does it pay for itself?’, whereas people tend to ask that about housing improvements,” Uta says. “Yes, your energy bills will be lower, but another benefit, which can’t be measured in dollars, is you will be far more comfortable, which is so important. “I think the value of a building should be measured by people’s happiness. If people love their house they will be happier in themselves, because our environment, both natural and built, has a profound effect on our lives.”