



Sustainable House Day 2018 preview Climate-ready designs Cradle-to-cradle construction



a \$5000 Biofilta sustainable garden package

Offer open to Australian residents. Details page 97.

Granny flat upcycle

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Tim and Greer's granny flat has been transformed into a warm, light living/dining/kitchen – the new heart of the home – with excellent visual and physical connection to the extensive back yard. South-facing glazing has been reduced in size to improve thermal performance; large sliding doors on the west open onto a jacaranda-shaded deck. Instead of pushing them over and starting again, this Melbourne couple opted to retain and extensively refurbish their solid brick house and granny flat, integrating them to form a functional, generous family home.



Sydney's inner-urban laneways, currently lined with garages and acting as service lanes, are undergoing change and diversification of use. Peter designed his studio as a model for how this transformation can be done well.

> better av up

This studio dwelling above a laneway garage in inner Sydney is both a comfortable, compact place to live and a benchmark for this type of development.



OPEN HOUSE SUNDAY 16 SEPTEMBER WESTERN VICTORIA

Recycled materials is one area where the closed loop philosophy can fall down. "We don't know where these materials have been or the content of the finishes used on them," says Quentin. Documentation is important to the true recyclability of the house so he has kept accurate records that identify the material and construction methods used, to enable future generations to recycle it safely and efficiently.

Cradle to cradle

Thanks to the choice of materials and construction techniques, this comfortable family house in western Victoria is almost entirely recyclable.

> WORDS Anna Cumming PHOTOGRAPHY Nic Granleese

ELECTRONIC ENGINEER TURNED

builder Quentin Irvine has been interested in 'closed loop' design principles since university, when he read the regenerative design manifesto Cradle to Cradle: Remaking the way we make things by German chemist Michael Braungart and US architect William McDonough. When the time came to build a family home on their block of land in the small western Victorian town of Beaufort, Quentin and his partner Katherine decided to go beyond the standard considerations of sustainable building - passive solar design, energy efficiency and use of eco-friendly materials - to ensure that as far as possible, the house would be recyclable at the end of its life.

"The house is made of materials that are technologically or biologically recyclable and is screwed and nailed together. Wherever glues, paints and sealants have been used, they are natural and biodegradable in all but a very few instances," Quentin explains.

He points out that often, potentially reuseable building materials are rendered too difficult or impossible to reuse or recycle by modern construction methods. "As a builder, my jobs often involve knocking down parts of houses. I realised that because of the construction techniques used, the older houses basically are recyclable; these days it's changed and houses are all glued together."

Quentin took pains to stick as closely as possible to mainstream building techniques so that his design ideas would be readily replicable by the mainstream building industry. "If you look up the specifications in the National Construction Code (NCC), often there is a 'screw' option as well as the more standard 'glue and nail' option. Nothing that we did is that 'out there'; it just involved thinking about recyclability at every tiny step of the way."

Built across the width of the block and opening to the north-facing back garden (Katherine's pride and joy), the modest two-storey house is just one room wide to maximise cross ventilation and solar gain. "Beaufort is pretty cold for nine months of the year, so passive solar gain is a priority," says Quentin. "The design is biased towards winter performance, with large northern double-glazed windows and doors to admit winter sun, and plenty of insulation." This attention to passive thermal performance



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Beaumont Concepts' award winning CORE 9 house at The Cape development in Cape Paterson, Victoria, will be opening its doors along with the rest of its street on Sustainable House Day. CORE stands for Carbon Positive, Zero Waste, Recyclability and Economics and represents a dual commitment to affordability and sustainability. All article images: Leo Edwards



Star-stuck? How to make the most of house energy ratings

House energy ratings are critically important for improving the quality and comfort of Australian homes – and yet many of us don't really understand them, let alone know how to check our homes are being built as designed. We ask experienced thermal performance assessor Erika Bartak to explain the way ratings work in practice and how to interpret their documentation, plus provide some simple steps for avoiding unwanted surprises.

HOUSE ENERGY RATINGS WILL BE FAMILIAR TO MOST

Sanctuary readers. Featured projects often list the overall Star rating, and these ratings are easy shorthand for talking about energy efficiency in our homes – if it's over 6 Stars then the thermal performance exceeds the minimum standard, and it's likely the project team has prioritised this in the design.

While a house energy rating is not the complete picture of energy-efficient and sustainable housing, it is an important step in the process and could be key to keeping your energy bills to a minimum. But anecdotally, it seems that many households don't receive the formal documentation of their house energy rating when they build or renovate – or if they do, they are not fully informed what the energy rating and its documentation means for them.

In this article you'll find out when you should get involved in

the energy rating process, who to talk to, and how best to avoid unwanted surprises. I also include an overview of the formal documentation of a house energy rating – the NatHERS Universal Certificate – to help you interpret it and understand its importance.

MAKING THE MOST OF THE HOUSE ENERGY RATING PROCESS *What is required?*

In most locations around Australia, a 6 Star house energy rating (out of 10 Stars) is required for new stand-alone dwellings (that is, Class 1 buildings), while apartments (that is, Class 2 buildings) require a 6 Star average across all units in the development, with a minimum 5 Star rating for each individual apartment. There are some exceptions for dwellings in warmer climates where appropriate outdoor living spaces are provided, and discretion is usually applied to alteration and addition projects depending on the extent of new and renovation works, and the retained existing parts of the building. You'll need to check with your state or territory building authority to confirm exactly what's required in your location.

Why should you be interested?

Put simply – because it's your house! A new build or renovation is a big investment, probably of both your time and money. And our houses are expected to last a long time, so the choices you make



€9

The CORE range of houses were optimised using NatHERS design tools and this one rates 9 Stars. This was achieved through optimal passive solar design, a well-sealed and highly insulated building envelope and thermally broken double-glazed windows and doors.

features of the assessed dwelling, in order to meet the nominated Star rating. The Certificate is required to match the final 'for construction' drawings and specifications. It is therefore a neat summary of the important building features that influence thermal performance and energy efficiency, such as insulation levels in the roof, walls and floors, and window frame and glass types (for example, timber or aluminium; single/double/triple glazed; any solar control or low-e treatment).

Any changes to these details will likely change the energy performance of the house – so it may be necessary to update the rating and Certificate if changes are made prior to or during construction. You could refer to the Universal Certificate during construction, to keep an eye on any changes or substitutions, and discuss these with your designer and builder. Similarly, if you are looking to buy or lease an existing dwelling with a provided Universal Certificate, and you (or a building inspector) can see that the specifications do not match the constructed dwelling, the house energy rating may not be correct.

Our previous article in *Sanctuary* issue 28 explained the inclusions and limitations of a house energy rating in more detail. But in summary, it's important to remember that a rating is a standardised assessment that allows comparison between dwellings. It predicts an energy load for heating and cooling based on the location and climate, and standardised occupancy assumptions. It doesn't predict actual energy use specific to your household, its behaviour and selected heating and cooling appliances – nor does it consider energy used elsewhere around the home, such as lighting, water heating and plug in appliances. While it can be a useful design tool, it is still primarily used to demonstrate minimum regulatory compliance.

FURTHER INFORMATION

NatHERS website:

www.nathers.gov.au/owners-and-builders/nathers-universal-certificate Your Home is an excellent and comprehensive resource: yourhome.gov.au

CSIRO's Liveability real estate framework: <u>liveability.com.au/appraisal</u> Sanctuary 28 article 'Rating the Star system'

Minimum energy efficiency requirements are described in the National Construction Code (NCC): <u>abcb.gov.au/ncc-online/NCC</u>

CORE 9 House details: <u>beaumontconcepts.com.au</u> or read the profile on <u>sustainablehouseday.com</u>





green

Lawn can get a bad rap – some tear it up for gardens while others replace it with fake grass. But in the world of Diggers Club veteran, Keith Edwards, when it comes to turf there are only pros and no cons.

A COUPLE OF YEARS BACK I MADE

significant changes to the landscape of my home. The exotic trees and shrubs were replaced with plantings that would give me a return with fruits and vegetables that, in the long term, could be eaten straight from the plant and the excess preserved for the rest of the year.

Part of the lawn made way for raised vegetable gardens, leaving just enough space for the grandchildren and the dogs to play.

There were times that I looked at

the remaining lawn areas, including the nature strip, with thoughts of what better alternatives there could be than constantly bringing out the mower. Could it be totally planted out, paved, or artificially turfed? Could the verge be turned into a garden or, better still, a productive vegetable garden? But before acting, I thought back to some far-flung research I once read, which measured the benefits of lawn.

Years ago, I was fortunate to have worked with the Department of Agriculture, in turf research, and was lucky to work with and meet some lateral thinking people who saw turf, and its contribution to our environment, in ways that gave me a better understanding and appreciation of its role.

Lawn is a key part of the garden design at the Garden of St Erth, a Diggers Club property in Blackwood, west of Melbourne. Image: Claire

Takacs, courtesy of Diggers Club

Popular lawn types have changed over time to suit lifestyles and climate. We now commonly see grasses that creep across the soil, rather than the more conventional upright growing varieties such as bluegrass, ryegrass and tall fescue that gave lawn a bad name. These upright types require the mower be set at its highest setting to allow the root system to reach deep down into the cool, moist soil. However, most people prefer the look of a low-cut grass sward, so instead lower the mower cutting height, which has the affect of killing off the grass. Few people realise the shorter the grass on top, the shorter the root system below must be to sustain that growth. A couple of hot days without water and the root zone's in the dry area and it's game over for this type of grass.

The 'creeping' type of grass, with varieties of kikuyu, buffalo and couch, all of which are commonplace in most of our landscapes today, perform so much better and are more forgiving to being low-cut. These varieties perform extremely well all over Australia, and are best sourced as Turf, as they may be problematic to sow as seeds.

The benefits of lawn are enormous in the personal landscape of our homes.

Turf grasses play an important part in controlling our climate. Overlooked or perhaps never imagined as being so, they act as organic air conditioners. A 15 x 15 metre (225 square metres) area of green lawn will produce approximately 28kW of air conditioning (a complete home air conditioning system can produce up to 14kW of cooled air).

The lawn will be approximately 10 to 14 degrees Celsius cooler than a paved surface, and a much more pleasant experience to walk or sit upon – especially in urban areas where temperatures can be as much as 5 to 7 degrees hotter than nearby rural zones.

There are also many environmental benefits of lawns that many don't consider: they absorb noise, remove dust and smoke particles from the atmosphere, absorb sulphur dioxide and carbon dioxide, effectively control erosion by intercepting rain and slowing its flow before it reaches the soil. Dense grass generates oxygen, for example that 15 x 15 metre area of lawn would produce enough oxygen for a family of four. Lawns can purify water - they filter water as it leaches through the rootzone and then down into the underground aquifers, protecting the microbes that will help break down chemicals into harmless materials. They also provide ecosystems that can support an abundant population of earthworms estimated at 200 to 300 per square metre; this activity increases the macropore space within the soil that results in higher soil water rates and its water retention capacity.

A green lawn doesn't just look and feel great, but provides people and those living organisms we don't consider often enough, with so many benefits. My lawn is here to stay.

Keith Edwards (B.AppSci. Landscape Architecture) is Garden Design Manager with The Diggers Club, Australia's largest gardening and heirloom seed community: diggers.com.au.

TURF TYPES

Even if you can't afford to purchase enough to do your whole project, I would suggest it is best to purchase a few rolls of turf and cut them into 100mm squares and plant them lightly into the soil at about 1 metre apart, water and feed well and with time they will creep together and form a full lawn - a great cheaper option, best done in the warmer months. Named varieties of these turf types are, palmetto buffalo (a softer leaf form, great for lying and playing on), sapphire buffalo, prestige buffalo, couch varieties QLD blue, Aussie blue, tropika blue couch, wintergreen, stadium sports and Santa Anna couch. For kikuyu varieties look for kendra and oakridge. All of these grasses are very tough, but for constant wear and tear, choose varieties of couch and kikuyu; the most drought tolerant being kikuyu. The best for shade tolerance, low maintenance and all year colour would be sapphire buffalo.

CLEANER LAWN CARE

Regardless of the type of lawn, it will always need mowing at least a few times a year. The conventional petrol lawnmower is very polluting, with no emission controls, and fuel vapours are toxic and potentially carcinogenic. Rechargeable electric mowers are not only fume-free, you can charge them from solar energy for completely emission-free mowing. There are rechargeable mowers for all lawn sizes, from little lightweight machines like the Ozito PXCLMK-218, to beefier machines like the 82V Victa Power Cut Mulch Or Catch lawn mower or Dewalt XR brushless mower. Indeed, there are options now to suit almost any lawn size and type, so there's no need to be breathing toxic fumes or messing with flammable fuels.

The same applies for other lawn care machines such as line trimmers, with models equal to or better than their petrol counterparts, just quieter and safer. And the great thing is that these machines are now much cheaper than they used to be, and are available at most decent hardware stores. Image: Diggers Club garden at St Erth.

