

CASE STUDY: A Grand Design in Kinglake

Summary

Application	Off-grid
Location	Kinglake, Victoria
System Objective	The client had lost his previous home on Black Saturday so the solar and storage system must survive and operate at extreme temperatures. It also fits with the ethos of a home with sustainability as its cornerstone.
Commissioned	May, 2015
Installed PV	5 kW
Useable battery storage	15.36 kWh
Designed & installed by	Ian Conibeer, Energy Connections



Background

On 7 Feb 2009, Victoria was subjected to the worst bushfires in the nation's recorded history and became known as Black Saturday. Chef and restaurateur Dan Zeidan witnessed this devastation first-hand, losing his Kinglake property to the fire eight years ago. But after meeting his partner Vicky Kordatou, a spark was reignited that pushed the duo into the eco arms of sustainability warrior Joost Bakker, who designed a groundbreaking structure that ticks every sustainability box and so much more. Living in a similar eco structure himself, green wall creator Joost Bakker adapted his own home's design for Dan and Vicky. Grand Designs Australia captured the journey of building this unique home.

Challenges

Comprising several complex layers, the build began with pouring concrete over hundreds of small plastic dome-shaped stools "laid out in rows as if setting up for a concert, not a concrete pour", observes Grand Designs Australia presenter, Peter Maddison. The plastic stools are an insulation technology, which captures the air in the roof and

ceiling space, pumps it underneath the slab, cools it or heats it and then pumps it to the other side using a 12-volt pump/fan — leaving the home at a constant 22 degrees Celsius. A 6.5 tonne shipping container was then craned onto the slab, which essentially formed the spine of the robust steel frame — the only non-eco, but recyclable, material used in the build. The walls were then packed with straw bales, covered in galvanised steel, topped off with non-flammable magnesium oxide board and encased by 7 tonnes of recycled crushed red bricks in a steel mesh cage. “The house is completely made of recyclable products and is a zero-waste house,” says Dan. “It’s really important it’s a house that’s bushfire-safe and can withstand a fire front and ember attacks.”

Solution

Ian Conibeer from Energy Connections designed an off-grid solar and storage system matches the ethos of the ultra-sustainable home. The green roof necessitated that the majority of the solar panels were ground-mounted away from the main building. There are limited panels on the roof of the shipping container which is embedded in the main building and houses the bathroom. The ground-mount panels are located next to a second shipping container which houses some panels and the energy storage system comprising the SP PRO, a string inverter and sodium nickel chloride batteries which are 100 % recyclable and heat tolerant to 60°C+.

Outcomes and Benefits

Dubbed by Peter Maddison as a “highly conceptual building that offers peace of mind”, the Kinglake house is a sign of hope for the future of eco building, showcasing the staggering progression of sustainable technology that can be utilised on a local level in the home — proving innovation’s not just for the powers above. Dan and Vicky have completed exactly what they set out to do all along — create an honest house without the trimmings.

*Source: elements of this case study were reproduced from an article on [Complete Home](#)
Photo credits: Rhiannon Slatter & Ian Conibeer*



System Components

Multi-mode inverter	Selectronic	SPMC481-AU, 5 kW, 48V
Grid-tie inverter	KACO	Powador
PV Array	Sunrise	12 x 250 watt ground mount 8 x 250 tilt portrait
Batteries	Fiamm	2 x FIAMM Sodium Nickel Chloride, 200 Ah, 48V



Ground mount panels and energy storage room located away from the main residence