

# *The* GREEN *life*

This unique house outside Port Elizabeth boasts both energy efficiency and a low carbon footprint

When Brian van Niekerk, MD of the Rhino Group, wanted to demonstrate the energy efficiency of the products his company manufactures, building a house in the sustainable development-orientated Crossways Farm Village outside Port Elizabeth was the answer.

He commissioned architect Steff Mulder of CMAI, the urban designers for the estate, to come up with a design that would incorporate energy-generating and water-saving features, plus be practical for family living.

"The setting dictated the design of the house and its response to the environment, but the challenge came in coordinating the technology unobtrusively," explains Steff, who also made use of simple passive design elements such as positioning openings in the right places for airflow, north-facing orientation for natural light and placing the solar PV panels at the correct angle for maximum energy production. Double glazing coupled with specialised Aruba walling enabled the architectural team to include large expanses of windows and glazed doors to bring in the views.

"The house generates more energy than it needs," says Brian.

## AT A GLANCE

**THE ARCHITECT:** Steff Mulder of CMAI Architects (pictured).

**THE CLIENT:** Brian van Niekerk, managing director of the Rhino group of companies.

**THE BRIEF:** A house that demonstrates all the sustainable, green living features offered by the Rhino Group including energy generation, water harvesting and purification, walling and countertop production. It also had to make the most of the views and be suitable for family living with entertaining spaces both indoors and out.

**THE HOUSE:** An entirely off-grid 450m<sup>2</sup> home on different levels with three bedrooms, two bathrooms, open-plan living areas and a rimflow pool.



A series of batteries and inverters in the garage, charged by the roof's PV panels, can power the house for two days.

"The Aruba blocks minimised construction time and, together with Enviro-Tuff roofing and double glazing, give improved insulation reducing the need for heating and cooling," explains Brian. In winter, a dual-purpose heat pump heats water for the underfloor heating while at the same time cooling water which cools a wine fridge. In summer, a thermal tower extracts warm air from the highest point and the cooling effect of cross-ventilation is aided by the aqua gardens, which provide cool humid air, while



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the temperature on the verandas can be lowered by a high-pressure misting system.

Rainwater is harvested from all roofed areas as well as the parking zone, where water drains through the surface into a series of storage tanks holding 30 000 litres. This is extensively filtered to produce potable water. All black water and organic kitchen and garden waste are fed through an Agama BiogasPro digester which delivers enough gas for four hours of cooking daily. Grey water meets up with black water after the digester and both are treated by a trickle filter, a reed bed system and further filtering before being used to flush toilets and irrigate the garden.

"It's an ongoing experiment," says Brian. "And I'm proud to say it's one of only 50 homes globally to incorporate all these water- and energy-saving solutions, making it an energy-plus home." 



**SOURCES** Agama [biogaspro.com](http://biogaspro.com) Aruba Eco Building Systems [aruba.co.za](http://aruba.co.za) or 021 704 0707 CMAI Architects 044 382 6732 or [cmai.co.za](http://cmai.co.za)  
Crossways Farm Village 042 286 0939 or [crosswaysfarmvillage.co.za](http://crosswaysfarmvillage.co.za) Rhino Group 041 451 3197 or [rhinogroupsa.co.za](http://rhinogroupsa.co.za)