

International award for House Rhino

Nelson Mandela Metropolitan University (NMMU) researchers scoop first place at the distinguished International Global Sustainability Conference.

South Africa's well publicised electricity shortages may well have inadvertently helped NMMU researchers because their paper highlighted the appropriate integration of unique off-the-grid solutions resulting in an energy-plus home. An energy-plus home generates more electricity than it uses from external sources, it contributes to reduction of demand on the national grid, and to reducing carb emissions.

House Rhino – the project

Rhino Plastics MD, Brian van Niekerk's new sustainable technology house constructed within the Crossways Farm Village, just off the N2 in the Eastern Cape near Thornhill, is the subject of an outstanding international academic award.

The house he designed in conjunction with architect, Chris Mulder and Associates (CMAI), was planned to be completely self-sufficient and contains what has been described as a benchmark model for integrated energy systems. It has been widely publicised, features in

internet searches, and has attracted the attention of architects, builders, and students from many parts of the world.

Included in its distinctive features is an aqua garden incorporating a natural water-treatment plant linked to a rim-flow pool, natural lighting, double-glazed windows, water-based under-floor heating and cooling, a roof that generates solar energy, and electrical energy stored in a large battery-set. Rainwater is harvested and treated before reuse; effluent water, organic waste and grass cuttings are



Photo credit: Chinyso Group



processed by a bio-digester to yield cooking gas for the home; and the primary building material has a low carbon footprint – insulating concrete form (ICF), created from interlocking expanded polystyrene.

A significant part of the Crossways development is the removal of foreign vegetation and re-establishment of natural coastal belt thicket and fynbos. Rainwater is harvested from angled roofs and street pavements, and water from the village's sewage treatment plant feeds into a man-made bird reserve's wetland.

The award-winning study

Congratulations to NMMU Department of Construction Management academics,

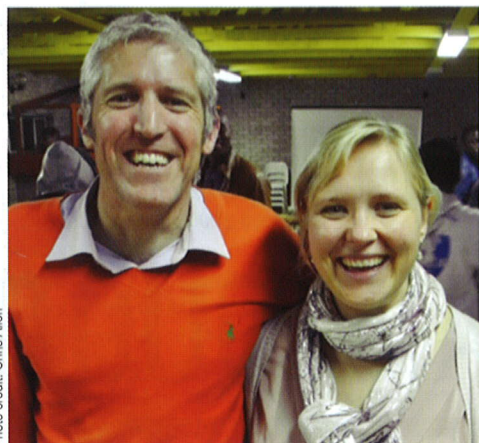
Chris Allen and Katharina Crafford, whose study of this unique off-grid South African home was hailed at a global sustainability conference in the UK.

Their paper, **AFRICAN ENERGY-PLUS CONSTRUCTION: A CASE STUDY OF HOUSE RHINO** received the Chair's Award for best paper at the recent Sustainable Ecological Engineering Design for Society (SEEDS) international conference at Leeds Beckett University in the UK. Their research report reinforces the growing call for housing developments worldwide to incorporate sustainable, energy-plus homes. The paper was selected from a number of competitive entries by conference chair, Professor Chris Gorse.

To BUILD asked the authors of the paper a few questions about their work:

Why is the award important to NMMU and to South Africa?

Most research on energy efficiency and sustainability in the built environment is from first-world northern hemisphere institutes that have access to large research budgets and also research specifically in their climatic environment. By making specialists in the field of sustainability, particularly those in the built environment, aware of what is happening in South Africa, we have raised the profile of the university, provided an opportunity for future joint research projects, and increased the potential to tap into research budgets from European countries or even commercial entities wishing to test applications in a different climatic environment. This is of particular interest to universities to diversify their income streams and to attract good post graduate candidates to their programmes to carry out research that will contribute to local and international knowledge.



Chris Allen and Katharina Crafford

What was the thrust of the paper that you jointly submitted?

That creating an energy-plus residence in a southern African environment is not only theoretically achievable but can provide a template for future construction that reduces the impact of buildings on our environment. The paper explains the technology that can be used to achieve this and the levels of energy that can be produced that allow practitioners a practical guide to use on future projects, rather than simply referring to theoretical values that have not been tested and verified.

Why was the House Rhino project selected as the topic for the paper?

It provided an excellent case study opportunity in close proximity to the university, which also enabled it to be a living lab and teaching opportunity for students and practitioners alike. By documenting what has gone on at House Rhino we provide peer reviewed research that increases the level of respect for the outcomes so that it is not simply deemed as marketing of a concept but rather as proof of the concept.

What was the response of the designer and owners upon hearing about this award?

Overjoyed, as can be discerned from the article subsequently published in the HERALD newspaper about the award!

Please describe the studies from elsewhere in the world that were also submitted?

The conference is on sustainability from a general perspective so covered aspects from the recycling of coffee granules to create a high-yield growing medium, to devices that reduce air in central heating systems to make them more efficient for energy use, and the recycling of inner city housing to regenerate inner city neighbourhoods. There were also a number of papers on more sustainable communities and means of creating opportunities to increase sustainability implementation in schools to give the next generation practical skills to survive changes in our environment. †

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