

Green retrofit of low-income homes in Durban

A green retrofit of 30 low-income houses in Cato Manor, Durban, led by the Green Building Council of South Africa (GBCSA), addresses two of the most pressing imperatives facing South Africa and other developing countries.

These are creating sustainable human settlements and addressing climate change, in other words, both mitigation and adaptation.

The initiative demonstrates the socio-economic, health and environmental benefits which were proven by the award-winning energy efficiency retrofit of more than 2 300 homes in Kuyasa, Cape Town. The Kuyasa project, South Africa's single biggest project of its kind to date, attracted carbon finance as the world's first Gold Standard Clean Development Mechanism (CDM) project. The benefits included energy cost saving, reduced illness and safety risks, skills training and job creation for the poor, as well as reduced greenhouse gas emissions and environmental impact.

The Cato Manor retrofit project, like the Kuyasa project, involves fitting each home

with a solar water heater, insulated ceiling, efficient lighting and heat-insulation cooker. It includes additional 'greening' elements such as rainwater harvesting, which allows for better water and food security, and the planting of Indigenous trees.

Benefits of energy efficiency in low-income housing

South Africa has built more than 2,5 million low-income homes in the past fifteen years and is targeting a further 3 million by 2025. So far, 'green' considerations have not generally been a priority.

People living in low-income housing spend a disproportionate amount of their income on energy and suffer a disproportionate health burden. Illnesses include major respiratory diseases from extreme temperatures and local pollution caused by the burning of fossil fuels like paraffin for heat and cooking.

Improving the energy efficiency of low-income homes reduces energy costs, the health burden and safety risks for residents. It also reduces environmental damage, most notably by reducing the greenhouse gas emissions associated with South Africa's predominantly coal-generated electricity.



Energy efficiency and introducing more renewable sources of energy are current priorities for South Africa as it faces a medium-term national power supply shortage and steeply rising electricity tariffs. Significant job creation potential is another major reason to pursue energy efficiency measures.

The green retrofit site

The site is a small cul-de-sac of 30 homes in Cato Manor made up mostly of semi-detached reconstruction and development programme (RDP) homes funded by government.

One of the buildings within the site is uMuthiMAYCHE, a musicians' rehearsal and performance space developed by the RAW Foundation, based in The Netherlands, working with Durban-based interdisciplinary creative collective, Dala, and the local Sukuma Arts Centre, with funding from the Netherlands Architecture Fund.

The local community was involved the process and the building is made entirely from second-hand, recycled materials from the surrounding area.

The team which conceptualised, designed and implemented the Kuyasa project is managing the retrofit in Cato Manor in conjunction with Durban-based Khanyisa Projects.

Energy efficiency elements of the retrofit

- The **solar water heaters** used are affordable, SABS-approved, 100-litre, low pressure, evacuated tube-type heaters with no electrical backup connection. The evacuated tubes are imported, but all other components are produced in South Africa and local content by total value is greater than 85%. This product was selected for its superior performance qualities. It delivers balanced cold/hot pressure, 'safe' tempered water at 50 to 60°C, and, importantly, will last a very long time. It has a life-time guarantee against corrosion.
- Insulated material provides **ceilings** that improve thermal performance in the homes. The ceiling board and other materials for this are produced in South Africa.
- **Safe electrical wiring.** Electrical reticulation to plug and light points was provided throughout the houses using professional standards and SABS-approved materials and products.
- **Efficient lighting.** The residential standard in South Africa has been incandescent light bulbs, but this project uses more efficient Compact Fluorescent Lighting (CFL).
- **Plumbing.** Pipe reticulation systems were installed to bring hot water supply into the kitchen where the only existing (cold water) tap was originally placed.



- **Wonderbags™** are heat-retention/insulation cookers that save energy as well as time and make the kitchen a safer place. If used an average of three times a week, Wonderbags™ can save 0,5 tons of carbon per year per house. Wonderbags™ have been provided for each home, along with training on how to use them.
- **Rain-water harvesting system.** Houses have been fitted with gutters, a 2 500 litre rain-water harvesting tank and reticulation system, wherever technically possible. (Many were built- without timber rafters, purlins or trusses to which to attach gutter brackets.) The system provides emergency water supplies in periods of drought or service interruptions as well as water to grow food gardens.
- **Other elements.** The Botanical Society is funding indigenous trees for this street and the eThekwin Metro is allocating some of its LED street light bulbs to this road.

Registration of carbon credits

This retrofit project will be registered as a Voluntary Emission Reduction (VER) project on the voluntary carbon market, through an independently audited registry called Credible Carbon. It is a very small-scale project and the sale of credits will generate only a small level of carbon revenue, but it has important symbolic value.