

Fact Sheet

REEECAP 1.4, 1.5, 1.8 & 1.9 : Energy efficiency in buildings

Objective

The aim of these studies was to evaluate energy efficiency (EE) implementation in building structures.

- Reviews were made of building codes and regulations
- Low cost building plans were appraised and updated (also for owner-built implementation)
- A competition was held for the best energy efficient low cost house.



Environmentally friendly clay structure at Eningu, Namibia

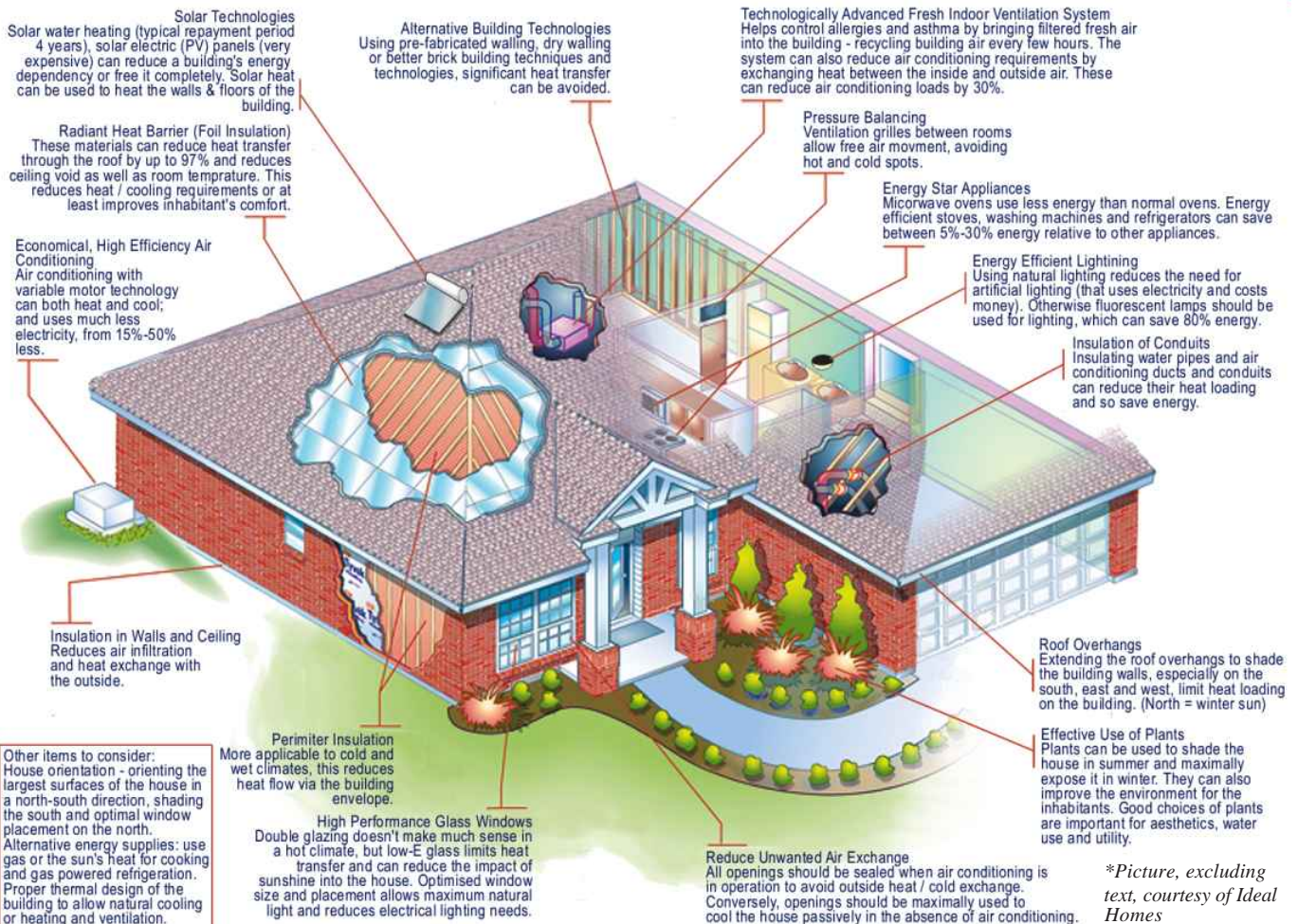
Background

Energy efficiency and the incorporation of renewable energy technologies in Namibian buildings have been mostly neglected in the past. However, shortages of Eskom supply capacities as of 2007 have highlighted the necessity of such practices in preserving limited resources and reducing carbon emissions.



Fired clay brick (an energy intensive resource) building under construction

Overview of Projects



Overview of Projects

Harsh Reality

The projects identified that the income levels of low-income housing inhabitants would not allow them to operate on a level of energy use that would rationalise most large capital investments to improve energy efficiency (i.e. to reduce **electricity** use). For example, most low-cost housing designs do not allow for an [electrical] water heater at all, making it futile to specify a technology such as Solar Water Heating (SWH).

The Good News

There are many other technologies that can offer good financial savings through low life-cycle costs and quick payback periods, improve comfort and reduce energy requirements (see below).

Low Cost Home Construction

Resources are available from Habitat Research and Development Centre to assist owner-builders in energy efficient, effective and safe construction.

Affluent Housing, Commercial Buildings

Architects and other consultants should be required to educate their clients regarding energy efficiency and renewable energy. In the absence of regulation, the choice remains the client's, but at least it can be an educated one!

Building Codes and Regulations

- Namibia currently uses South African building standards, with no energy efficiency requirements.
- Namibians should voluntarily implement energy efficiency and renewable energy measures to reduce their power requirements and save some money too!

Available Technologies

- Alternative building materials:

• Adobe / cob / sun baked clay bricks : very cheap and accessible, have low embodied energy, relatively durable and attractive. They have good insulation and thermal mass properties.

• Compressed earth bricks: can be very strong and durable, with low embodied energy. They have good insulation and thermal mass properties.

• Fired clay bricks: very high embodied energy, but can be extremely strong and durable.

- Many alternative, efficient technologies offer lower life-cycle costs.

Cost saving!

Lower costs!

Terms

- **Life-cycle costing:** the evaluation of the total cost of an item over its lifetime, as opposed to just its purchase cost. Calculate a life cycle cost by summing all purchase, maintenance, depreciation, replacement costs and subtract benefits, such as income generation, of a technology. Compare this totals with alternative technologies.
- **Payback period:** the time it takes an efficient device to pay for its initial price difference, with a non-efficient device, by its savings. Simple payback calculations use the cost difference between two alternatives divided by the expected savings from using the more expensive technology.
- **Insulation:** action or capacity to resist the transfer of thermal energy (heat or cold)
- **Thermal mass:** the ability to absorb, store and then release thermal energy
- **Embodied energy:** electrical or heat energy required to create a certain material or object

Namibia should subscribe to rating systems such as:



Good payback!



Fewer imports!

Energy Star, which rates electric and electronic devices that consume less energy often pay for their extra costs over some time.

Natural building techniques and local materials, such as cement, can make Namibia independent of expensive imports



It should not be forgotten that houses house people...

REEECAP Fact Sheets are available from:

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