

Towards Energy Efficiency in Buildings in Eastern Africa: Kenya, Uganda, Tanzania, Burundi and Rwanda

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Energy Efficiency and Renewable Energy

Presentation Overview

- Background information
- Energy access
- Electricity Consumption Trends
- Why Energy Efficiency?
- Objectives
- Benefits of Energy Efficient Buildings
- Main components of the initiative
- Way forward
- Conclusion

Background Information

Energy used in buildings is estimated at 40-50% of the total national electricity consumption.

Majority of buildings in most African countries with tropical climates - are replica of building designs in western countries with cold and temperate climates.

Between 50-60% of power generation in the region come from hydro-power plants. Their capacity is being stretched by rapid population growth, increased urbanization, climate change and growing energy demand (9% annual).

Between 40-50% of energy is generated from thermal power plants.



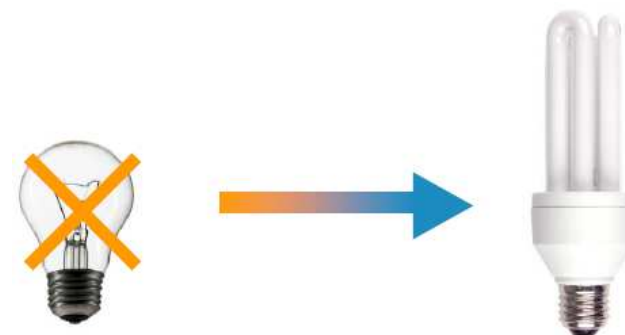
Energy Access

- Most developing countries rely on imported fossil fuel to address their energy need.
- Access to modern energy remains very low in Africa.
- Power rationing is a frequent recurrence.
- Annual energy consumption per capita in East Africa are the lowest in the world:
 - 22 Kwh in Burundi
 - 31 Kwh in Rwanda
 - 63 Kwh in Uganda
 - 83 Kwh in Tanzania and
 - 179 Kwh in Kenya

All energy importing countries !
Diffused high level of energy poverty !

Why Energy Efficiency?

- Recurrent energy crises in the region;
- The demand of energy exceed the supply;
- High cost of imported energy;
- Inefficient energy use is costly and contributes to energy waste and GHG emission.
- More efficient energy use results in greater access and availability.
- It is cheaper to save one MW of electricity than to build one MW of new generation capacity.
- One dollar saved = One dollar earned !



Electricity consumption trends

In Kenya,

- Domestic consumption of electricity exceeds commercial use and;
- Domestic connections grows at about 13% annually.

However, in Nairobi,

- High cost of electricity during the last 6 years has reduced domestic consumption by 5 %.
- Only few domestic lights and electric appliances are used.



Objectives of the Programme

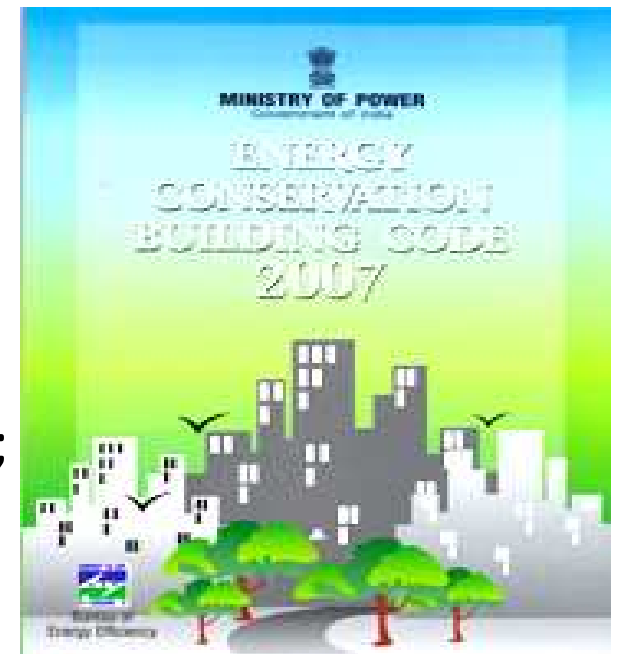
To Mainstream Energy Efficiency Measures into Housing policies, Building Codes and building practices in East Africa

To Achieve considerable avoidance of CO2 emissions as a result of improved EE building practices.



Main activities:

- Conduct baseline studies to establish energy consumption trends;
- Identify opportunities and potential for energy saving;
- Raise awareness and build capacities on Energy Efficiency in Building (EEB) practices;
- Review Housing Policy to include EE measures and facilitate their enactment;
- Make available guidelines on auditing energy in the buildings;
- Develop appropriate financing systems for EEB;
- Promote reduction of GHG emissions in human settlements.



Main targets:

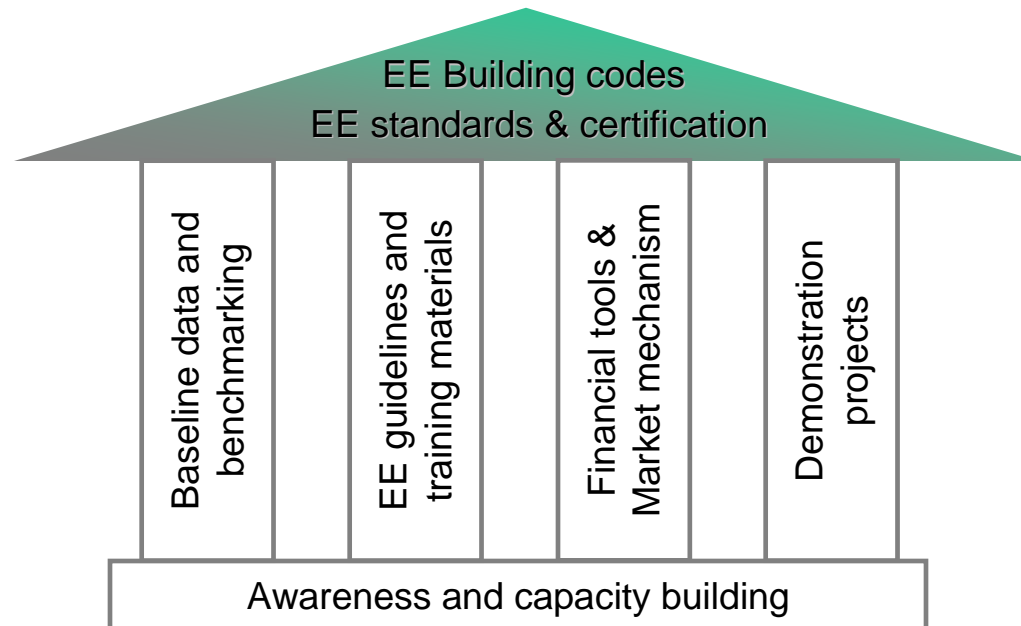
- Energy consumption reduction in new building by 40% - 50%;
- Energy savings in existing buildings by 10 % - 30 %;
- Improved indoor thermal comfort;
- Enhanced property value;
- Increased number of people with access to modern energy ;
- Adoption of energy efficient building code.



Main Components of the EEB Programme

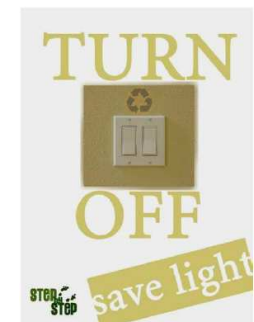
1. Create Awareness, and conduct training programme on EEB.
2. Mainstream EE into national housing policies and develop energy efficiency and conservation building codes for different climatic zone.
3. Develop EE measures and guidelines for each climatic zones.
4. Establish appropriate financial and market based mechanisms to promote EEB.
5. Incorporate EE measures on all government housing projects, and donor funded housing projects and encourage such practices in the private sector.
6. Launch the Africa Energy Efficient Building Award.

Main Components of the EEB Programme



1. Education: Awareness creation and capacity building in EEB

- Assess Energy Consumption trends in buildings.
- Conduct Energy Audits in residential and public buildings.
- Establish Energy consumption benchmarks.
- Identify Saving Potential.
- Sensitize Stakeholders on passive building design concepts.

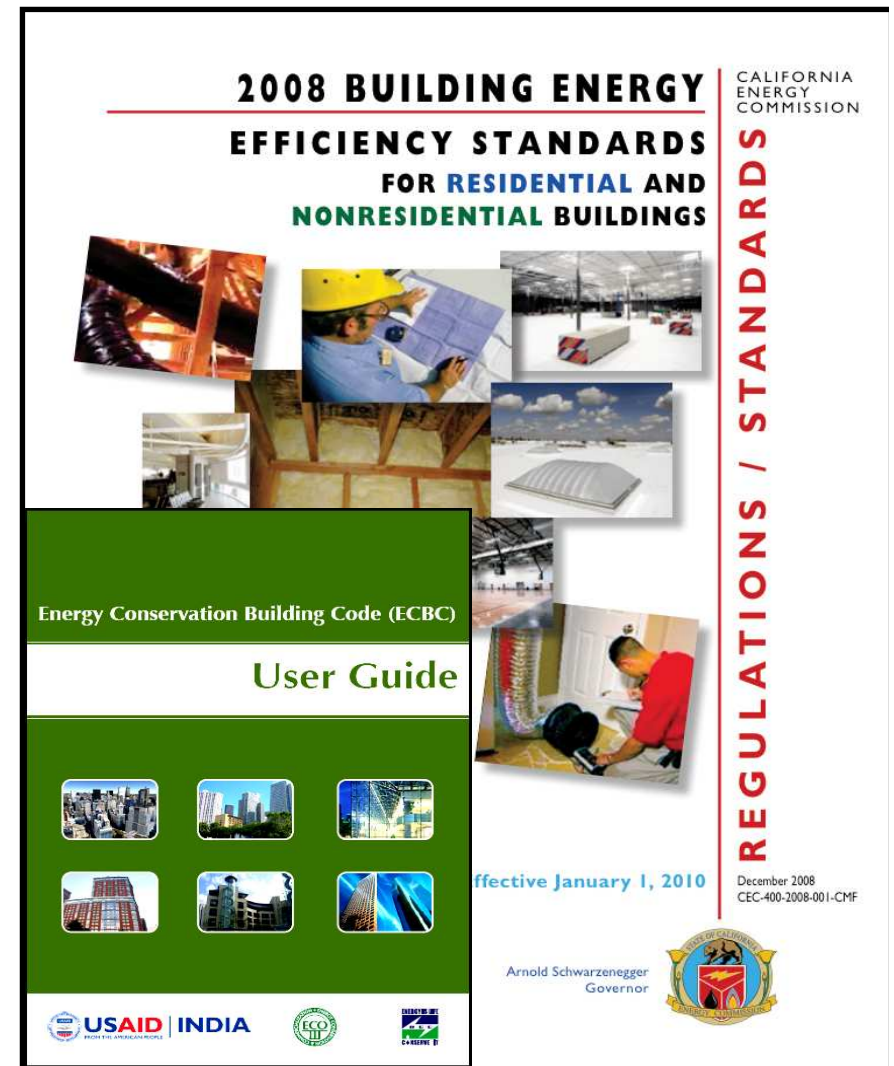


Step By Step's campaign poster

2. Policies and regulations

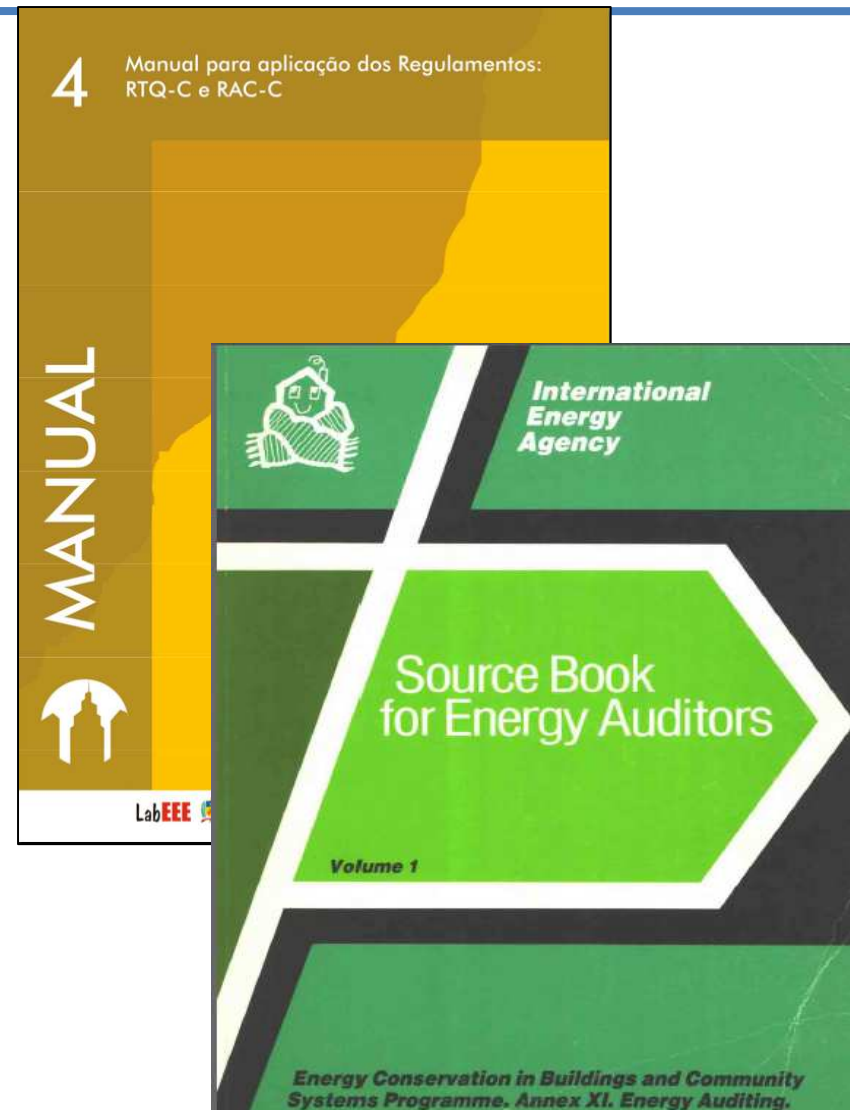
- Review country specific housing policy to include EE.
- Prepare EEB policies, session papers and by-laws for enactment, adoption and enforcement.

Energy efficient building Code has the highest potential of saving energy in buildings over a long run.



3. Tools and instruments

- Develop tools for applying EEB measures;
- Publish Hand books on passive design techniques;
- Create EEB Information Points;
- Conduct training programs.
- Training and tools will focus on:
 - Building orientation;
 - Thermal comfort;
 - Natural ventilation and cooling;
 - Natural lighting;
 - Water heating system;
 - Electric appliances etc.



4. Financing instruments of EEB

- Sensitize financial institutions, private developers and power utilities on the economic benefits of EE measures. Create green mortgage
- Encourage government to establish fiscal and administrative incentives; subsidies program and to allocate national budget for promoting EEB;
- Build the capacity of power utilities on EE measures and on initiatives to promote and adopt energy demand management.



5. Demonstration projects

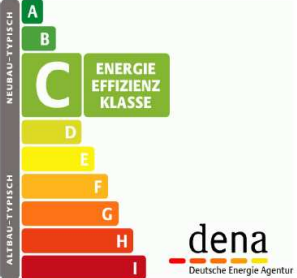
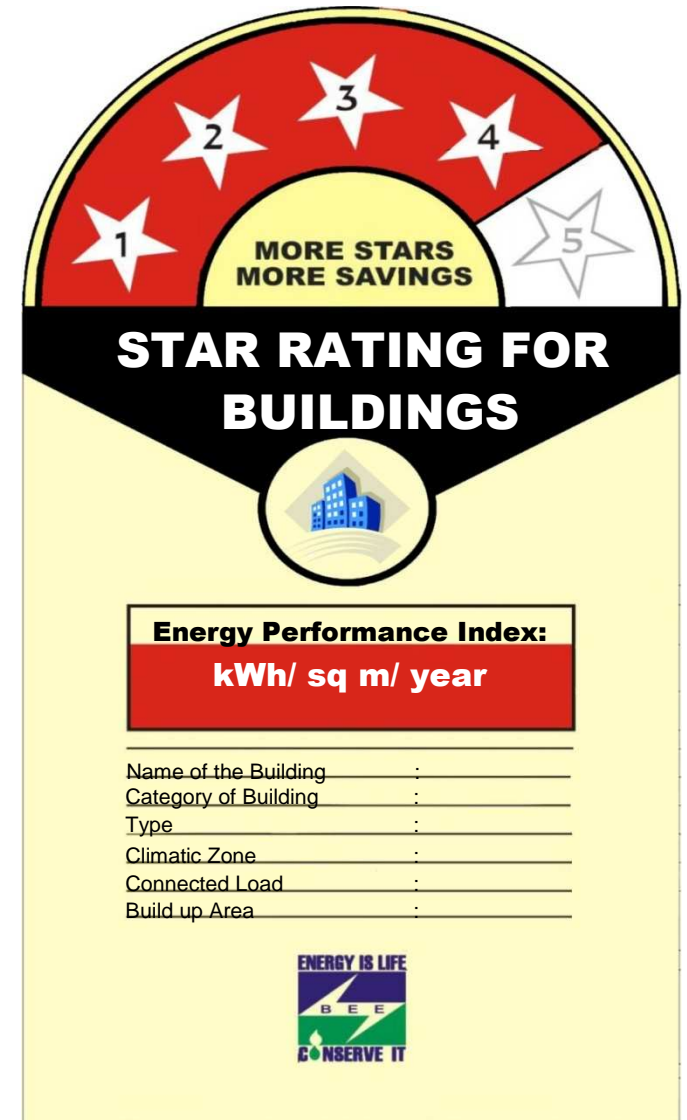
- Encourage the construction of more EEB within a short time.
- Ensure that at least 10 000 new buildings comply with EE principles;
- Work with governments, donors and developers to make sure that new housing projects are EE;
- Conduct practical training with real estate developers and other housing stakeholders to sensitize and provide them with technical assistance on EEB.
- Incorporated EE in all ongoing housing schemes.



Africa Energy Efficient Building Award

- Establish national and regional EEB award systems to acknowledge best practices and reward excellent achievement;
- Use internationally agreed green building rating systems as criteria for EEB Award.

Class	Primary energy use (kWh/m ² /year)
A	0-80
B	81-110
C	111-150
D	151-200
E	201-250
F	251-300
G	301-350
H	351-400
I	401 and above

Way forward

ARCHITECTURE

Green concept building up

Seeking to be environment friendly, firms take the cue from developed markets

BY JEVANS NYABIAGE

Environment friendly buildings are becoming the in-thing globally. The Greens or Green Buildings are slowly finding space in Kenya, with three firms vying for the pioneer tag.

With many companies in sub-Saharan Africa adopting green building, the trend is building potential that could spur future industry growth, according to a report released last year by US construction market analysis company, McGraw-Hill Construction.

It says office and residential property markets will lead the green building revolution in the region and, even in a sluggish market, present a key area for market growth.

In Kenya, the building that has been hyped to be moving towards energy-neutral concept is the United Nations Environment Programme Nairobi office, which aims to



seeking certification by the US Green Building Council's Leadership in Energy and Environmental Design (LEED).

The green buildings save a significant amount in terms of funds spent on utilities be-

stand out include the building being able to withstand high levels of earthquakes. Mr Richards says it will be bomb-proof as well.

Just like Coca-Cola's, Stan-chart's building will harvest

An artist's impression of Stanchart's new head offices that has been constructed to reduce energy consumption.

PHOTO / COURTESY



Conclusion

- A building lasts for several decades 40-50 years;
- Energy efficient decisions made today have a long-term impact on energy consumption and cost implication;
- Awareness creation and capacity building are imperative;
- Knowledge and dissemination of best practices is essential;
- Building codes, standards and by-laws are crucial for enforcing and up-scaling EEB;
- Using renewable energy technologies reduce the energy bill and the carbon footprint of the building with less emissions of green house gases, leading to zero energy building.



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