PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: FULL SIZED PROJECT
THE GEF TRUST FUND

Submission Date: 6 September 2008

Re-submission Date: 7 April 2009

PART I: PROJECT IDENTIFICATION

GEF PROJECT ID[1]: 3788 **PROJECT DURATION:** 48 months
GEF AGENCY PROJECT ID:
COUNTRY(IES): Kenya, Uganda, Rwanda, Burundi and Tanzania
PROJECT TITLE: Promoting Energy Efficiency in Buildings in Eastern Africa
GEF AGENCY(IES): UNEP
OTHER EXECUTING PARTNER(S): UN-HABITAT in association with the National Ministries of Housing in the five countries
GEF FOCAL AREA (S)[2]: Climate Change
GEF-4 STRATEGIC PROGRAM(S): CC-Sp1-Building-EE
NAME OF PARENT PROGRAM/UMBRELLA PROJECT: N.A.

INDICATIVE CALENDAR*	
Milestones	**Expected Dates mm/dd/yyyy**
Work Program (for FSP)	04/15/2009
CEO Endorsement/Approval	11/15/2009
Agency Approval Date	01/01/2010
Implementation Start	02/01/2010
Mid-term Evaluation (if planned)	02/01/2012
Project Closing Date	01/31/2014

* See guidelines for definition of milestones.

A. PROJECT FRAMEWORK

Project Objective: To mainstream energy efficiency (EE) measures into housing policies, building codes, and building practices in East Africa and to achieve considerable avoidance of CO_2 emissions as a result of improved building practices.

Project Components	Indicate whether Investment, TA, or STA[b]	Expected Outcomes	Expected Outputs	Indicative GEF Financing[a]		Indicative Co-Financing[a]		Total ($) c =a + b
				($) a	%	($) b	%	
1. **Error! Bookmark not defined.**	TA/STA	1. Energy consumption trends in buildings according to building use, building type, and outdoor climate are understood. 2. Energy audits of 20-40 residences are carried out in Kenya and Tanzania and 8-15 in other countries. 3. Building energy consumption bench-marks are established to determine performance. 4. Opportunities and potential for energy	1. Parametric annual data on energy consumption for 20-40 buildings with different types of building designs, uses, and located in different climatic zones as found in East Africa. 2. Based on existing good practices, develop statistics on potential savings both in capacity in megawatt (MW) and energy savings in megawatt-hour (MWh) in the target countries according to different types of buildings. 3. Awareness building	730,000	45	900,000	55	1,630,000

[1] Project ID number will be assigned by GEFSEC.
[2] Select only those focal areas from which GEF financing is requested.

		savings are identified. 5. Awareness is raised and capacity is built in energy efficient building practices. 6. The findings and recommendations of the reports on energy consumption trends in buildings (energy audits) published.	through distribution of information on passive building features and EE tips and immediate EE gains for building practitioners, owners, users, decision makers and utilities. 4. Development of training courses and toolkits to guide building designers, builders and users. 5. Technical training programs for building designers, contractors, and municipal authorities in energy efficient building practices.					
2. Mainstream EE into national housing policies and develop energy conservation building codes for each climatic zone.	TA	1. Country specific housing policy is reviewed to include EE and it is ready to be enforced and enacted. 2. Framework instrument or by-laws to facilitate and enforce EE measures are developed and are ready to be used.	1. Improved construction codes and standards based on review and analysis to EE performances identified above and from international best practices. 2. Energy efficient building policies and sectional papers or by-laws for each of the five countries developed and lobbied for and ready for enactment. 3. Demonstrated benefits, through testing of proposed building policies/codes/ by-laws with Kenya and Uganda as pioneers and a timeframe for Tanzania, Burundi, and Rwanda. 4. Public awareness media outreach strategy and policy on EE building design and good EE practices pertinent to the climatic zones of the region.	360,000	42	500,000	58	860,000
3. EE strategies and guidelines for each climatic zones of the region.	TA	1. A well-elaborated tool for applying EE measures is available. 2. Practitioners, architects, engineers, contractors are aware of passive building design elements and techniques for natural cooling, natural heating and	1. Passive building guidelines for each of the climatic zones of the region are developed. 2. A list of appropriate building materials with their thermal properties and recommendations for their suitable uses is compiled.	178,000	37	300,000	63	478,000

		natural lighting, sun shading, etc. 3. Energy efficient building centres or information points are established to disseminate awareness and information material on best practices. 4. Guidelines on auditing energy used in building are made available.	3. Operational model(s) and mechanisms for implementing EE measures developed; and capacity strengthened of a national organisation that will serve as focal point for advocacy and promotion of energy efficient building practices.					
4. Appropriate financial and market based mechanisms to finance the implementation of EE measures in buildings	TA	1. The financial benefits of EE measures are well understood by the public, housing finance institutions and power utilities. 2. Government official are aware of the usefulness of allocating special budget provision for energy demand management. 3. Increased capacity of power utilities that enable them to acknowledge and reward customers that invest in energy efficient buildings.	1. Strategies that encourage housing finance institutions, banks, associations of private developers, estate developers, and power utilities, to include EE measures in their packages/ products or services. 2. Improved opportunities for using soft loans, grants, fiscal incentives to pro-mote EE measures and identification of suitable partners for implementation. 3. Access to international financial mechanisms including CDM explored.	250,000	33	500,000	67	750,000
5. Incorporate EE measures on all ongoing government housing projects and donor funded housing projects, and encourage such practices in the private sector.	TA	1. More energy efficient houses constructed within a short period of time. 2. Significant amount of energy saved through energy efficient practices. 3. Greater reduction of GHG emissions is observed in the region from the new housing units that apply EE measures. 4. Handbooks on passive design methodologies in different tropical zones are published. 5. Energy efficient practices are main-streamed into government and donor supported housing development	1. Specific energy saving measures and policy options for government-led housing construction projects are identified and developed. 2. Participation of key stakeholders in the housing sector, (National Housing Corporations, public and private estate developers, and builders) in EE and conservation practices is encouraged. 3. Better educated practitioners and general public on the importance and advantages of passive solar design. 4. Construction and use of a minimum of 100,000 of additional energy efficient buildings a year.	395,000	14	2,500,000	86	2,895,000

		programs. 6. Avoided CO_2 emissions of a minimum of about 7 million tons (MT) over a period of 20 years through (i) the construction and use of an additional 100,000 energy efficient buildings each year (about 4.5 MT); (ii) retrofitting of existing buildings (about 2.4 MT); and (iii) construction and use of 5,000 passive energy efficient houses (about 140,000 tons).	5. Retrofitted existing buildings that are equipped with solar water heating (SWH) systems and compact fluorescent lamps (CFLs) or other energy saving lamps. 6. The construction and use of a minimum of 5,000 passive energy houses that are equipped with SWH and CFLs, and provide with natural lighting and ventilation systems, and meet high EE standards.					
6. African Energy Efficient Buildings Award.	TA	1. Regional recognition to selected buildings that have shown systematic and serious progress with regard to the efficient utilization and conservation of energy in buildings.	1. An operational national energy efficient buildings committee is established in each country to select and promote building practices that meet the award's criteria. 2. Case studies and useful information on EE in buildings are disseminated through the award ceremonies and the website.	655,000	39	1,060,000	61	1,715,000
7. Project management				285,000	31	640,000	69	925,000
Total project costs				2,853,000	31	6,400,000	69	9,253,000

[a] List the $ by project components. The percentage is the share of GEF and Co-financing respectively of the total amount for the component.
[b] TA = Technical Assistance; STA = Scientific & Technical Analysis.

B. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE and by NAME (in parenthesis) if available, ($)

Sources of Co-financing	Type of Co-financing	Project
Project Government Contribution	In-kind	1,300,000
GEF Agency(ies) UNEP	In-kind	200,000
Bilateral Aid Agency(ies)		
Multilateral Agency(ies) UN-HABITAT	In-kind	1,500,000
State housing agencies and private sector (national housing corporations, housing finance institutions, building owners, housing design firms, real estate developers and power utilities)	In-kind and cash	3,000,000
NGOs (national and international)	In-kind	250,000
Others (Universities, architects' associations, housing institutions, media)	In-kind	150,000
Total Co-financing		6,400,000

C. INDICATIVE FINANCING PLAN SUMMARY FOR THE PROJECT ($)

	Previous Project Preparation Amount (a)[3]	Project (b)	Total c = a + b	Agency Fee
GEF financing		2,853,000	2,853,000	285,300
Co-financing		6,400,000	6,400,000	
Total	0	9,253,000	9,253,000	285,300

D. GEF RESOURCES REQUESTED BY AGENCY (IES), FOCAL AREA(S) AND COUNTRY(IES)[1]

GEF Agency	Focal Area	Country Name/ Global	(in $)		
			Project (a)	Agency Fee (b)[2]	Total c=a+b
UNEP	Climate change	Kenya	1,240,000	124,000	1,364,000
UNEP	Climate change	Uganda	708,000	70,000	778,000
UNEP	Climate change	Rwanda	190,000	19,000	209,000
UNEP	Climate change	Burundi	190,000	19,000	209,000
UNEP	Climate change	Tanzania	525,000	53,000	578,000
Total GEF Resources			2,853,000	285,000	3,138,000

[1] No need to provide information for this table if it is a single focal area, single country and single GEF Agency project.

[2] Relates to the project and any previous project preparation funding that have been provided and for which no Agency fee has been requested from Trustee.

Each participating country will tailor its activities to the available project budget, including GEF grants and co-financing. As is often the case in the Region, Kenya will play a key role in pioneering, while Uganda and Tanzania are also dedicated to playing a very active role in the project. Burundi and Rwanda will participate and carry out similar activities but these may be on a more limited scale and will adopt solutions tested in the three lead countries. The executing agencies will ensure the smooth flow of information. At the national level, the project will be located within the office of UN-HABITAT Program Manager (HPM), hosted at UNDP national office. Each HPM office will receive an equivalent of 20% of the resource allocated for agency fee by the respective country.

PART II: PROJECT JUSTIFICATION

A. STATE THE ISSUE, HOW THE PROJECT SEEKS TO ADDRESS IT, AND THE EXPECTED GLOBAL ENVIRONMENTAL BENEFITS TO BE DELIVERED

The energy used in residential and commercial buildings accounts for a significant percentage of the total national energy consumption. It is estimated that 40% of the total national electricity generated in developing countries is used in urban buildings alone and these consume more energy than the transport and industry sectors. The International Energy Agency (IEA) also estimates that, globally, on average, 42% of national energy is used in buildings.

The building sector encompasses a diverse set of end-use activities, which have different energy use implications. The amount of energy used in a building for cooling, heating and lighting, is directly related to its design, orientation, the materials used, the occupants' needs and behaviour, the function of the building and the surrounding micro-climate. However, building design does not directly affect the energy used for water heating, cooking, electrical appliances and the occupants' use and customs.

With rapid population growth, increasing urbanization and continued rural to urban migration due to economic/social/political reasons and to climate change[4], East African's urban housing stock is increasing rapidly along with the demand for both traditional and modern sources of energy (electricity, charcoal, kerosene, and liquid petroleum gas (LPG)) for domestic uses. East African countries have the highest annual urbanization rate in the world, estimated at 4.5%.

[3] Include project preparation funds that were previously approved but exclude PPGs that are awaiting for approval.

[4] Climate change is suspected to be the cause of the recurrent droughts in Kenya and Tanzania and of the floods in Uganda.

The annual demand for new urban houses is estimated on average to be 100,000 units per country. In Kenya, only 40,000 new urban houses are built every year and similar numbers are built in Tanzania and Uganda, resulting in around 6.75 million square meters built every year. A large proportion of these new houses is built by National Housing Corporations, real estate developers, private contractors and individuals.

In Kenya, Uganda, Rwanda, Burundi, and Tanzania, the supply of electricity is far below the demand. Over 65% of the power supply in the region comes from hydropower plants built almost three decades ago to serve a small proportion of the population. Today, with a population that has more than doubled, rapid urbanization and an increasing demand for energy from growing economic and industry sectors, cities and towns are experiencing severe power shortages and power rationing is a daily occurrence. Thermal power plants are therefore brought in to match, at least in part, the supply of electricity with the demand. Fossil fuel based power generation in Eastern Africa is currently at approximately 920 MW and will increase by 30-50% over the next 10 years, if new alternative sources of power are not created.
The diesel generating capacity of the region is currently as follows:

- Kenya – 411 MW (which is 32% of generating capacity of 1,267 MW);
- Uganda – 100 MW (with 240 MW for the total generating capacity and 390 MW for the peak demand);
- Burundi – 5.5 MW (with an effective capacity of 30.2 MW. The supply deficit varies between 12.9MW during the rainy season and 23.5 MW during the dry season);
- Rwanda – 21 MW (with the total generating capacity of 45.2 MW);
- Tanzania - 378 MW (with a total installed capacity of 939 MW, 561 MW of which are from the hydro power plants and the remaining from thermal and natural gas).

The total generating capacity for the whole region is 2,524 MW.

Given that a large proportion - 40 % - of energy is used in buildings, this energy shortage can be addressed by reducing electricity consumption through demand management and EE measures. This will result in a decrease in the capital outlay required and in the running costs of thermal generators, whether from national or individual power back-up systems. To this effect, a number of countries in the region are now engaged in strategic energy demand management, in order to minimize the economic losses incurred during power blackouts.

The majority of new buildings in Sub Saharan Africa (i.e., in tropical climates) are replicas of buildings designed in the west (i.e., in cold and temperate climates) and do not take into consideration the differences in climate (for example high rises in Nairobi, Dar es Salaam, and Kampala). Many urban buildings were designed and constructed when energy was cheap and climate change was not a major concern as it is today. Inefficient design and construction using materials produced with intensive use of energy (such as cement, steel, aluminium, glass etc.), combined with poor understanding of thermal comfort, passive building principles and energy conscious behaviour, has led to energy wastage in buildings. As a result, buildings are heavily reliant on artificial means for indoor comfort: cooling/heating, ventilation and lighting. There are no major costs involved in the design of an environmentally friendly building, particularly in tropical regions. The increase in investment is also limited during construction since emphasis is put on locally available materials that are adapted to the local climate. However, it can be very expensive to convert a poorly planned and designed building into an energy efficient one since considerations such as the building's orientation to the path of the sun, the prevailing winds, the use of sun shading devices and also the use of materials that reduce or increase thermal exchanges from indoors to outdoors would have to be taken into consideration. When passive building EE measures are taken care of, right from the planning and design stages, and appropriate materials adapted to the local climate are used, the resulting building will consume less energy and generate fewer GHG emissions.

As energy is central to any development activities, it should not be wasted but put to productive uses. The need to supply enough energy more cheaply is crucial for poverty eradication and climate change mitigation. Investing in EE measures that result in the saving of 1 MW of power will certainly be less expensive than building a new power generating plant of 1 MW. Governments in the region, in Rwanda and Uganda for example, are attempting to solve their peak energy demand problems by adopting energy demand management measures such as replacing electric water heaters with Solar Water Heaters (SWH) and also by replacing incandescent lamps with CFLs. Short term capacity building initiatives have also been carried out in research institutions (University of Dar es Salam and University of Kampala) to promote the use of renewable energy technologies (RETs) in the urban environment, particularly in buildings, to reduce energy demand from conventional sources and create greater comfort.

Given that cities all over the world are responsible for over 70% of GHG, the challenge is to implement policies that encourage intelligent energy consumption and create less pollution. Fiscal incentives and environmentally sound building codes are some of the concrete measures that can contribute in the short term to massive energy reductions. For instance, Barcelona has made SWH installations mandatory for all new and renovated buildings, to supply at least 60% of the energy needed to heat water. There are already several hotels in Kenya that use SWH for their hot water, resulting in a drastic reduction in electricity bills. It is also estimated that installing 500 SWH in tropical countries will save 1 MWh of electricity during peak hours.

To increase power supply, governments in East Africa often allocate funds to subsidize new generating capacity or they subsidize the cost of petroleum-based generation. Reducing demand: by promoting energy saving measures through awareness campaigns and sustainable urban energy policies; by encouraging the development of green buildings through fiscal and financial incentives; by giving regional awards to energy efficient buildings; and, by developing regulations that incorporate EE into design standards and codes in order to facilitate adoption of energy friendly technologies and wise energy use, constitutes a sustainable approach to addressing, in the short term, the deficits in power supply.

The overall goal of this initiative is to promote EE and environmentally responsible measures in buildings. This will also contribute to climate change mitigation, while maintaining optimum indoor thermal comfort. New buildings offer opportunities for efficient energy uses. For example, provision of natural lighting systems that avoid the use of artificial lighting during the day, will result in less expenditure on power bills. Proper building orientation, the use of sun shading devices, the positioning of openings to allow natural ventilation and free air movement, and the use of appropriate building materials (according to their thermal characteristics) are all important considerations in passive building design or bioclimatic architecture. All these elements were taken into consideration in tropical colonial architecture. Most traditional architecture also scrupulously integrates passive elements into their designs. For example, the simple positioning of openings in traditional architecture at the coast, allows free indoor air movement that minimizes the use of fans and air conditioning.

This project intends to mainstream passive building considerations into the East African building sector. Kenya and Uganda will act as lead countries in the region and will be the groundbreakers in East Africa by enacting and enforcing regulations as well as creating the conditions for sound building practices. Other countries will carry out the same activities at national level and will benefit from the information gained and lessons learned within this project. It is expected that, while the two lead countries will begin the activities, all the East African countries taking part in the present initiative will reach the same level of achievement at least in terms of enactment of laws and regulations.

Without baseline information on energy consumption and conservation trends in existing buildings, the opportunities and potential for energy savings are difficult to identify and promote systematically. Energy audits of buildings are, therefore, imperative for developing effective policies and for setting realistic and achievable targets. These energy audits will constitute the first step of the present project.

Housing policies in East Africa focus more on quantity in order to address the shortfall rather than on the quality of the shelter. The development of environmentally sound human settlements is not a priority. Furthermore, common design practices do not take into account bio-climatic considerations. Reviewing existing policies/codes/standards and developing climate friendly building standards and codes will reduce the carbon footprint of new buildings. New policies and by-laws should set minimums (or thresholds) for energy performance in buildings according to their final uses and the surrounding climate. Emphasis will be put on: climatic factors that affect the buildings; thermal comfort factors and indices; principles of passive and thermal design; factors that affect the thermal behaviour of buildings; thermal control (cooling, ventilation and heating); sun shading; orientation of the building to the path of the sun; lighting (natural and artificial); and the use of locally available and re-useable building materials. The use of energy efficient appliances in buildings should be made compulsory, as is the case in Barcelona, Jerusalem, and other municipalities, where SWH and other energy efficient building components are mandatory. This, of course, should be applied initially to middle class people. In Beijing, following the adoption of mandatory energy saving design standards, residential buildings whose design does not conform to the EE standards are not given building permits.

Since efficient buildings can be marginally more costly and because codes only set a minimum, the project will promote market-based mechanisms and awareness systems. Kenya has created an EE award for industry, which has been very successful, and the project proposes to establish a similar award for EE in buildings. The feasibility of introducing Green

Labels to generate fiscal and/or financial incentives, as well as a fund for energy efficient building projects will also be carefully studied within the project. This project will work in close collaboration with the key stakeholders in the housing sector, in particular: the Ministry of Housing and Human Settlements (traditional partners of UN-HABITAT), which is responsible for the development and implementation of the national housing policies and building stock; the Ministry for Local Government, which issues building permits; the Ministry of Energy, which is responsible for power generation and distribution; building corporations; housing finance agencies; real estate developers; etc., to strengthen their capacity to implement energy efficient practices in building construction.

Furthermore, the project will encourage local governments to use part of the revenue collected through property tax and land rent to promote awareness of environmentally sound housing development. Estates with more than 20 housing units/apartments will be advised to build biogas plants as opposed to small decentralized sewage systems with septic tanks. Although not directly part of this initiative, interest in clean energy sources such as biogas plants will be encouraged so as to mitigate climate change. Methane (one of the GHGs) is produced through the biogas system and can be use for cooking and lighting.
One of the outcomes of this project is to assist countries in the region to adopt **"energy efficient building codes",** which will provide design norms for each of the climatic zones of East Africa and efficiency standards for equipment. These norms should include:
- Thermal performance for building envelopes (walls, roofs and windows;
- Luminance performance for lighting systems, (day-lighting, lamps, with emphasis on energy saving lamps).
- Energy performance requirements for heating, ventilating and cooling systems;
- Performance requirements for water heating systems, with preference for solar water heating systems.

These building codes aim to promote suitable design strategies which will drastically reduce the current share of energy used in the building sector.

B. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH NATIONAL/REGIONAL PRIORITIES/PLANS

EE is gradually being taken into consideration by most Eastern African countries following the continued energy crisis and frequent power rationing. Among the causes of power shortages are the drop in hydro power generation capacity due to droughts, and the sky rocketing price of fossil fuel that has doubled the cost of electricity generated from thermal power plants. Various attempts have been initiated by several governments to promote energy demand management. Almost one million energy saving lights, mainly CFLs, have been distributed in Uganda and Rwanda. The Kenya Power Utility (KPLC) is now running a campaign through the national media to educate people on the importance of taking energy saving measures.

Kenya

In the Kenya Energy Sector Policy Overview Paper, the emphasis is on the promotion of EE and conservation in general and also on ensuring security of supply through diversification of sources of energy. The Paper further emphasises the need for prudent environmental, health and safety practices. It also highlights the major challenges facing the energy sector, particularly the weakness of the power transmission and distribution infrastructure, which is due to limited investments in power system upgrading. This has serious consequences for the electric power system, which has losses estimated at 20% of net generation. The Kenyan Government therefore recognises the importance of EE as one solution to the energy crisis, both in the short and the long term. The Kenya Housing Policies Paper emphasises the need to promote the development and ownership of housing that is functional, healthy, aesthetically pleasing and environmentally friendly.

Uganda

In Uganda, so far, activities in energy conservation have been limited to preliminary energy audits of industrial and commercial buildings (mainly hotels). Efforts have also been made to increase awareness among stakeholders. The country's energy policy paper acknowledges that there have been insufficient incentives to introduce fuel/technology substitution e.g. electricity to replace the use of kerosene for lighting, LPG to replace wood fuel and solar water heaters to replace electric water heaters. Another major challenge is the lack of information about improved energy technologies and better efficiency practices. The policy document calls for the establishment of an EE law that will take into account the experience of other countries. The promotion of energy demand management is also emphasised.

This initiative complements the ongoing promotion of Solar Water Heating in Uganda, which is being carried out by The Renewable Energy and Energy Efficiency Partnership (REEEP). The aim of the promotion is to save electricity, especially during peak hours, by switching water heating in households and institutions from electric to solar.

Burundi

In 2001, only 28,708 families in Burundi were connected to the national grid. Modern energy still remains out of reach for the majority of the population. Today less than 2.2 percent of the population have access to electricity. It is therefore imperative that the little energy available is well conserved and proper energy demand management is put in place to increase access for those without this basic commodity.

Rwanda

Only 5% of Rwandans, 60% of whom live in Kigali, have access to electricity. Blackouts are frequent and the power infrastructure has deteriorated. There has been negligible investment in this sector since 1985. Much of the energy consumed in the country is imported. The focus of the Government's energy policy is to promote activities that will increase access to electricity and provide a quality and cost-effective service. Among the goals set out by the Government to address the energy crisis are: the enhancement of the overall electrical infrastructure to meet the growth in demand and to supply the quality of power needed; and, the implementation of a firewood and charcoal efficiency and substitution strategy to counter the deforestation crisis. The policy further emphasises the need to build human resources for the effective utilisation of energy.

Tanzania

The Tanzanian National Human Settlement Development Policy's goals, among others, are: to promote the development of satisfactory human settlements; and, to facilitate the provision of adequate and affordable shelter for all income groups in Tanzania.

Although increased EE is highlighted as a key objective in the energy policies of the target countries, none of them has an EE law/by-law/regulatory system for buildings and constructions. This project seeks: to mainstream EE into the existing legislation; and, to build on ongoing initiatives and develop an EE regulatory system for new and existing buildings. The project will also focus on green architecture, with the emphasis on effective policies, regulations and standards that integrate EE into building design. Furthermore, the Habitat Agenda adopted by the Second United Nations Conference on Human Settlements (HABITAT II), emphasises the need for increased use of energy efficient and environmentally sound technologies in building construction. Agenda 21 also stresses the importance of applying EE principles and of using environmentally friendly building materials and construction techniques. All the five countries in the region have subscribed to both Habitat Agenda and Agenda 21.

It is generally proven that a considerable reduction in energy consumption in the heating and cooling of buildings can be achieved through the employment of energy conservation measures and through the application of passive building techniques. The ultimate result of this initiative will be to demonstrate that this is possible in the region if and only if proper design norms are implemented.

C. DESCRIBE THE CONSISTENCY OF THE PROJECT WITH GEF STRATEGIES AND STRATEGIC PROGRAMS

This project is consistent with GEF strategies as it targets the creation of enabling policies (building efficiency standards and codes) and a market environment in which energy efficient technologies and practices for buildings can diffuse into the target countries. It also seeks to lay the foundation for complementarities between GEF resources and carbon finance backed investment by considering appropriate financial and, in particular, market-based mechanisms to trigger action in the area of EE in buildings.

D. JUSTIFY THE TYPE OF FINANCING SUPPORT PROVIDED WITH THE GEF RESOURCES

As the financial mechanism of the United Nations Framework Convention on Climate Change (UNFCCC), the Global Environment Facility (GEF) will assist Kenya, Uganda, Rwanda, Burundi and Tanzania building EE options and reduce the

consumption of fossil fuel through the provision of a grant that will be used to fund incremental costs related to construction of more energy efficient houses and buildings as well as support capacity building of key actors. The GEF financing of $2.853 million will allow the leveraging of $6.4 million as co-financing, i.e., 1 USdollar from the GEF allocation will be matched by about 2.25 USdollars from national and multilateral sources, NGOs, and the private sector. It is estimated that the project will promote investments for retrofitting of existing buildings alone of more than $10 million. GEF grant financing will also allow five countries with limited access to alternative sources of financing to undertake this type of EE activity, which otherwise would not be done because of its longer term benefits. The expected follow on investments and benefits will be further evaluated during Project Preparation Grant (PPG) phase.

E. OUTLINE THE COORDINATION WITH OTHER RELATED INITIATIVES

UN-HABITAT will be the Executing Agency for the project; it will oversee overall progress, outputs, and development of policies under the project and be responsible for financial management, including preparation of annual budgets and accounting. For this purpose it will establish a project management office at the UN-HABITAT Headquarters in Nairobi, which will be headed by a project manager who will be supported by technical consultants and UN-HABITAT staff. UNEP/DTIE will share with UN-HABITAT the lessons learned from its Sustainable Buildings Construction Initiative (SBCI)[5] and its other global activities to promote EE in buildings. The project management office under UN-HABITAT will serve as the secretariat for the African Energy Efficient Buildings Award, and will conduct policy dialogues with UN-HABITAT's key traditional partners (Ministries of Housing/Human Settlements and Ministries of Local Government in the concerned countries) for the adoption of EE measures for buildings in national housing policies and municipal by-laws. Since the concerned Ministries of Local Government are responsible for the implementation of policies and building codes and regulations they will be represented in the steering committee for the project. The steering committee will be composed of all the identified key stakeholders in each country. The project will enter into partnerships with relevant key stake holders including the line ministries and work closely with local universities, national housing corporations, housing finance institutions, power utilities, associations of architects, local governments, and the private sector.
In each country, the project will be facilitated by UN-HABITAT's national programme manager (HPM) based at the local UNDP office. The HPM will act as the secretariat of the national steering committee and in collaboration with the ministry of housing will coordinate local project activities with the concerned partner ministries and other stakeholders.

The project will also coordinate with UN-HABITAT and UNEP initiatives that promote socially and environmentally sound building development through collaborative arrangements with the key housing actors (government, private sector organisations, donor agencies, housing finance institutions). Within its Slum Upgrading Programme, UN-HABITAT has been facilitating the construction of at least 200 housing units per year in the region. The EE component will be included in the design of these housing projects, and the initiative could be used for demonstration purposes. The project is consistent with the UNEP led global initiative on buildings entitled "Framework for Promoting Low Greenhouse Gas Emission Buildings" and will benefit from the UNEP's SBCI and the GEF funded global initiative on a building baseline for EE.

This project will use the results of the Energy Audits of buildings that the Government of the Republic of Uganda is developing as part of Government's EE programme. This Ugandan initiative covers 21 public hospitals, National Water and Sewerage Corporation installations, 6 public universities, 20 public buildings, 10 industries and hotels, 110 public schools and colleges, police buildings, and Kampala City Council street lighting. It involves: collection and analysis of energy consumption data; energy audit measurements; development of an energy monitoring and management system; recommendation of measures to improve EE; preparation of specifications for equipment recommended for efficiency improvements; and, preparation of an implementation plan for investments to improve EE in the establishments.

This project will partner with the Ministries of Housing and Local Government, the National Housing Corporations of the regions, and other stakeholders directly linked to housing development. The aim of this collaboration is to make sure that in all new policies for the design of houses, EE measures and considerations are provided for.

[5] SBCI is a partnership between the private sector and UNEP with four focus areas:
- improve support to EE in buildings from the Kyoto Protocol and other international agreements,
- evaluate and promote national policy tools encouraging a life cycle approach to buildings and construction,
- establish global benchmarks on SBC, and
- support SBC capacity building in developing countries.

This project will complement other ongoing GEF projects in the region, particularly the "Development and Implementation of a Standards and Labeling Programme" in Kenya and other countries of the East African[6] region, whose aim is to improve the EE of selected appliances and equipment in the residential, commercial and industrial sectors.

This project will also make use of the capacity built during the implementation of the two year African Masters Course entitled "Integrating Renewable Energies into Buildings" funded by the European Commission. The project was carried out in Tanzania, Uganda and South Africa and was tailored to professionals working in the built environment. It enabled them to acquire specialist skills in and knowledge of low energy design, an increasingly important field of architecture. The course provided a practical and theoretical foundation for architects and building professionals. Skills were developed in a range of different methodologies for evaluating environmental conditions and predicting the effects of design solutions. These included data collection and interpretation methods, and computer-based and physical simulations of buildings, set within a framework of low energy design principles, and against a background of often conflicting theories of sustainability. This project will promote suitable design strategies which will drastically reduce the energy consumption of a building without compromising on the basic needs of the users in term of climatic comfort and healthy environment.

F. DISCUSS THE VALUE-ADDED OF GEF INVOLVEMENT IN THE PROJECT DEMONSTRATED THROUGH INCREMENTAL REASONING

The project is unlikely to be feasible without GEF funding. The information gap on energy consumption trends in buildings, and the opportunities and potential for energy savings is unlikely to be filled without a systematic programme. Without this information to guide policy development, an enforceable energy efficient buildings policy cannot be formulated and thus the status quo will remain.

The regional approach of this project will avoid duplication of efforts and will increase efficiency in the use of resources, particularly if we consider that all the countries in the region have similar climatic zones. This is also an effective way of sharing information, knowledge and best practices in the region. With GEF support, it is likely that the review of building norms to include EE and passive building concepts will be adopted and implemented in all the five countries.

The project will also, through the **African Energy Efficient Buildings Awards**, compile a database of good and best practices to be shared among constructors and building practitioners. GEF funding will facilitate the establishment of this award system which, initially, will be managed by UN-HABITAT, and the secretariat will be gradually transferred to a regional association of housing developers, or any other housing institutions with sound capacities.

The amount of energy required to meet a building's net energy demand i.e. for heating, cooling, ventilation, hot water and lighting, could be supplemented by on-site renewable energy (RE). Though the project does not focus on RE it will promote the use of RETs such as solar water heaters, solar lighting systems, and the use of biogas for groups of houses and apartments, in preference to conventional solutions. Wind energy, and low-head micro-hydro systems will also be promoted. GEF projects in the region have been instrumental in the promotion and use of RETs.

G. INDICATE RISKS, INCLUDING CLIMATE CHANGE RISKS, THAT MIGHT PREVENT THE PROJECT OBJECTIVE(S) FROM BEING ACHIEVED, AND IF POSSIBLE INCLUDING RISK MITIGATION MEASURES THAT WILL BE TAKEN

The success of this project is dependent on the formulation of policies/by-laws and their enforcement and on the building of awareness. The bureaucracies involved in policy formulation at national level represent a key risk. To reduce this risk the project will engage in intense lobbying of and following up with key stakeholders, including members of parliament, the Ministries of Housing and Energy, and Local Authorities. It will carry out a number of awareness campaigns through the media to highlight the importance of EE and conservation in buildings. The project will also work directly with the municipal officers and housing engineers who are in charge of issuing building permits.

Another major risk is related to the sustainability of this initiative. Most building practitioners in the sector have little knowledge of passive cooling design. The lack of information on bioclimatic principles could also limit the adoption of these principles. People may want to reduce their energy bills, but are unable to access proper information. This constraint of limited knowledge and information barriers will be addressed by establishing an online information gateway and information centre in each country. The annual award will also serve this purpose. Capacity building training will also be provided.

[6] GEF Project ID 2775.

A further major barrier is the access to finance to implement EE measures. This project will remove this barrier by producing evidence of quick economic returns when efficient appliances are used in buildings. The project will develop reliable data which will attract interest and convince financial institutions and other stakeholders of the relevance of investing in energy conservation and management. EE is a potential selling point for landlords. Tenants, in fact, will prefer apartments/houses with low electricity bills, which result from the application of EE standards.

Further risks include: non-enforcement because of a disrupted political situation; the risk of local architects being driven by other interests, i.e., those of their clients; and the issue of split decisions between designers, builders, owners, and occupants. These and other challenges will be adequately addressed under component one.

Among the main climate change risks that would affect this project are a more than expected rise in temperature and an increase in intensity of precipitations, storms, floods, and droughts. Such increase in temperature would require more energy for cooling; however, the project is addressing this risk by developing passive cooling techniques and measures that will be able to deal with such higher temperatures. More frequent and more intense storms would expose buildings to frequent winds and badly affect highlands, coastal, and mountainous areas. The project will address this by providing sound solutions such as the construction of natural wind barriers to protect human settlements from storms and in disaster-prone areas, recommending preventive measures for environmental planning and management and human settlement. Increased intensity of precipitations would affect building structures and facilitate the rapid deterioration of building materials. This risk will be addressed through developing recommendations for proper management of rain water and use of appropriate buildings materials.

H. DESCRIBE, IF POSSIBLE, THE EXPECTED COST-EFFECTIVENESS OF THE PROJECT

California's Energy Efficient Building Policy was adopted in the late 70s. A survey carried out in 2003 established that energy savings as a result of this policy were 15% of the annual electricity use in the whole state. Similar best practices in the implementation of energy management policies around the world confirm such savings.
For this particular GEF initiative in Eastern Africa, the minimum target is 10% reduction for energy savings in buildings. At the moment, the total power generating capacity in the five countries is estimated at 2,524 MW with 920 MW generated from thermal plants. Given that 40% (about 2,948.0 GWh) of total annual electricity production is consumed in buildings, the project over its lifetime would reduce total annual electricity production by a minimum of 10% (about 294.8 GWh) and avoid a minimum of 295,000 tons of CO_2 emissions annually, which would total to an estimated 7 million tons (MT) of avoided CO_2 emissions over its lifetime of 20 years, assuming also that the percentage of the energy saved will increase gradually as new construction designs will become more energy efficient over the years.
Project outcomes can be achieved by involving all the stakeholders in the building construction sector. National housing corporations, housing finance institutions and real estate developers in the region, are responsible for the construction of over 70% of all new buildings. This amounts to over 100,000 units every year. By having in place an enabling policy and by building the capacity of architects, engineers, urban planners, decision makers, and private housing owners, this project will instil a culture of EE that will save energy and avoid considerable CO_2 emissions. The energy savings in buildings are to be achieved by construction of new energy efficient building units, retrofitting of existing buildings, and construction of fully energy efficient houses.

Based on an estimated number of new energy efficient building units of 100,000 to be constructed each year, more than 2 million new units will be built during 20 years (this is a conservative number). It is estimated that each new unit will save at least 10% of current its current electricity consumption or around 440 kWh per year, which would result in estimated avoided CO_2 emissions over 20 years of about 4,5 MT[7]. However, this is a rather conservative estimate as it assumes only 0.5 kilogram (kg) of CO_2 emissions per kWh of electricity produced whereas it is estimated around 0.9 kg of CO_2 emissions per kWh for peak power consumption in Africa and also network losses are not taken into account. Further, the number of new housing required will also increase over time.

Under the project, promotion of EE in existing buildings is also expected to result in avoided CO_2 emissions of about 2.4 MT[8]. The project will also facilitate the construction of at least 5,000 passive energy efficient houses that are equipped with

[7] Using the formula: 440kWh*100,000 units*factor 210^7*0.5kg of CO_2/kWh whereby 210 represents the compounded number of years over a period of 20 years.
[8] Assuming that an annual minimum of 47,000 of SWH systems will be installed in existing buildings and a minimum of about 7.5 million of incandescent lamps will be replaced with CFLs.

solar water heaters (totalling about 8,000 square meters) and CFLs, provide natural lighting and ventilation, and meet high EE standards. This would avoid a minimum of 7,000 tons of CO_2 emissions annually. As indicated in component 5, the project will work with ongoing government housing projects and donor funded human settlements program in the region to make sure that passive building techniques are incorporated in their designs. UN-HABITAT alone, through its Shelter Branch and the Slum Upgrading Program, is able to build over 500 houses annually in the region. Through this initiative, UN-HABITAT will provide technical assistance to ongoing housing initiatives to enforce the adoption of EE and conservation measures.

UN-HABITAT and UNEP will both build on their existing initiatives, expertise and networks related to building efficiency. The location of both institutions in East Africa also constitutes a key factor for cost effectiveness. The regional aspect, which allows five countries to benefit from project results with minimum GEF contribution, is an interesting feature. UN HABITAT will use its country offices and staff (Habitat Programme Managers HPM) as resources for the project. UN-HABITAT will also use its ongoing housing construction projects in the region to demonstrate EE practices. Private sector participants involved in the benchmarking process will co-finance the project in kind through provision of equipment and/or the services required to collect data for parametric benchmarking. Through development and enforcement of policies the project will also leverage financing through the uptake of measures to improve EE in buildings.

Given the fact that many specialized building agencies and institutions are located in Kenya, and considering that there are other climate change related projects that have already produced successful results, e.g. The Energy Management Award organized by the Kenya Association of Manufacturers through the Centre for Efficiency and Conservation, Kenya has been identified as the leading country for this initiative. In addition to that, the city of Nairobi alone has two faculties of architecture and various colleges and schools of civil engineering.

I. JUSTIFY THE COMPARATIVE ADVANTAGE OF GEF AGENCY

The Government of Kenya, Uganda, Rwanda Burundi and Tanzania have approached UN-HABITAT and UNEP to implement the present initiative, based on past experience with UNEP/DTIE. In addition UNEP is planning to implement the global project “Global Market Transformation for Efficient Lighting” as well as a programmatic approach on efficient buildings. These initiatives will help define various key components, e.g. a phase-out strategy for obsolete technologies such as incandescent bulbs, and their replacement by modern efficient products such as CFLs. UNEP will implement the Global Buildings Initiative by defining baselines for building efficiency based on a thorough analysis of the gaps, which in the case of buildings, is lack of access to technology. The present project will be fully coordinated with these global approaches in order to benefit from the resulting findings and research, for instance, the establishment of methodologies for the development of labelling procedures, quality certification, the setting of standards or the elaboration of environmental safeguards, etc. At the same time, the global projects will take advantage of the identification of issues and corresponding solutions that may result from the present proposed project.

The United Nations Human Settlements Programme, UN-HABITAT, the executing agency is mandated by the UN General Assembly to promote socially and environmentally sustainable towns and cities with the goal of providing adequate shelter for all. To date UN-HABITAT has carried out several researches, studies and physical implementation projects on EE in buildings. More than 15 books have been published ranging from energy audit manual for use in the operation of buildings; energy conservation, improving EE in construction and in the production of building materials in developing countries etc. This project intends to build on this wide expertise and knowledge based, to develop policies and norms that are environmentally friendly and address climate change. UN-HABITAT, at the global level, is coordinating a Sustainable Urban Development Network that includes a component on Cities in Climate Change. The Shelter Branch is implementing the Settlements Initiative in Climate Change Mitigation. Through all these initiatives and activities, UN-HABITAT will contribute to the implementation of the project through substantive and in-kind contributions. Furthermore, the findings will be disseminated at the global level through its World Urban Forum as well as Ministries of Housing regional meetings and local authorities conferences.

This kind of project complements the normative and scientific positioning of UNEP, which is part of its comparative advantage. As part of its strategy in the climate change focal area, UNEP intends to develop similar projects in the field of technology transfer, aiming at promoting the replacement of obsolete appliances with the most recent energy efficient technologies. UNEP will disseminate the good practices developed in their global forums.

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):
(Please attach the country endorsement letter(s) or regional endorsement letter(s) with this template).

NAME	POSITION	MINISTRY	DATE *(Month, day, year)*
Dr A. Muusya Mwinzi,.	*Director General, National Environment Management Authority*	*Ministry of Environment and Natural Resources, Government of Kenya*	February, 12, 2008
Dr Keith Muhakanizi,	*Deputy Secretary to the treasury/GEF Operational Focal Point,*	*Ministry of Finance, Planning and Economic Development, Government of Uganda*	October, 24, 2008
Dr Salvator Ndabirorer	*Advisor in Ministry of Land and Planning, Tourism and Environment & Operational Focal Point.(Burundi)*	*Ministry of Land and Planning, Tourism and Environment of Burundi.*	October, 02, 2007
Dr. Rose Mukankomeje, Rwanda	*Operational Focal Point for GEF in Rwanda,*	*Environment Management Authority (REMA), Government of Rwanda*	June, 23, 2008
Dr.Ruth Mollel	*Permanent Secretary*	*Vice-President Office United Republic of Tanzania*	September, 24, 2008

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for project identification and preparation.

Agency Coordinator, Agency name	Signature	Date *(Month, day, year)*	Project Contact Person	Telephone	Email Address
Maryam Niamir-Fuller, Director UNEP/DGEF		April, 7, 2009	Edu Hassing, Task Manager UNEP/DGEF	(+33-1) 44 37 14 74	edu.hassing@ unep.org