

## PROJECT BRIEF

### 1. Identifiers:

Project Number:

Project Name:

Removal of Barriers to Energy Conservation and Energy Efficiency in Small and Medium Scale Enterprises (SME)

Duration:

5 Years

Implementing Agency:

UNDP

Executing Agency:

Kenya Association of Manufacturers for the Ministry of Industrial Development

Requesting Country or Countries:

Kenya

Eligibility:

FCCC ratified on 30 August 1994

GEF Focal Area:

Climate Change

GEF Programming Framework:

OP#5 - Removing barriers to energy Conservation and energy efficiency

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### 2. Summary:

The outcome of this project will be a reduction of CO<sub>2</sub> emissions resulting from increased energy efficiency within Kenya's small and medium scale enterprises. This will be accomplished by removing capacity and financial barriers through formal and on the job training as well as through the introduction of new financial mechanisms. A series of demonstration retrofit projects will be carefully selected, and financing obtained to complete the energy efficiency demonstrations. Full cost-recovery for the demonstrations will be ensured to prove to SME in Kenya that improving energy efficiency can be profitable. The project will enable entrepreneurial energy and engineering firms to emerge as viable energy service companies (ESCOs) which will be prepared to carry out the investments in improved energy efficiency on a sustained basis. After successful project completion and barrier removal, the total CO<sub>2</sub> emission reduction will be 4.2 million tonnes.

### 3. Costs and Financing (Million USD):

<b>GEF:</b>	- Project	USD\$ 3.023 m
	Project Support Services	USD\$ 0.130 m
	PDF Preparation	USD\$ 0.040 m
costs(UNDP)		USD\$ 3.193 m
	<b>Subtotal GEF</b>	

#### **Co-financing:**

	IA	USD\$ 0.500 m
	Other International UNDP	
(TRAC)		USD\$ 4.590 m
	Government (In kind)	<b>USD\$ 8.643 m</b>
	Private	

#### **Total Project Cost**

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### 4. Associated Financing (Million USD)

Energy Sector Reform and Power

5. Operational Focal Point Endorsement

Name: Mr. B. K'Omudho

Organ.: Min. of Environment & Nat. Resource

Development Project (approx. USD 5m)

Title: Director, National Environment  
Secretariat

Date: 26 January 1998

6. IA Contact: Ademola Salau

UNDP, RBA/GEF

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## **1 BACKGROUND AND CONTEXT**

1. The Government of Kenya accords a high priority to the development of the energy sector in a cost-effective and environmentally sustainable manner. Implementation of demand-side energy efficiency improvements is among the strategic development objectives in the industrial sector. In order to achieve this energy efficiency, the Government promotes energy audits of commercial and industrial enterprises, is developing demand-side energy efficiency management programmes, makes information available regarding the efficient use of energy and cost-effective technologies, and encourages private sector participation in the delivery of energy efficiency improvement measures.
2. In the past, investment in energy efficiency has been impeded by the historically low power tariffs and price control on petroleum products. This situation is being ameliorated through the new tariff policy, power sub-sector reorganisation and the newly liberalized petroleum market.
3. Kenya's energy scenario is dominated by a high degree of dependence on imported petroleum products. Combustion of petroleum products constitutes the predominant energy source in Kenyan small and medium scale enterprises (SME), accounting for 780,000 toe in 1996 -- and projected to double by the year 2020. Electricity is the second most important source of commercial energy, with installed capacity of 810 MW. Development plans for the next 15 years indicate that additional capacity of 1300 MW will be required.
4. In the conduct of various projects in Kenya SME in recent years, observed estimates of energy waste range between 10% and 55% of primary energy input. By enhancing energy efficiency awareness and removing financial barriers, the project will enable investments in energy efficiency. The associated energy demand reduction will increase profits and allow the expansion of existing industries, thereby alleviating the acute unemployment problem -- consistent with GOK policy to alleviate poverty.
5. A number of multi-lateral and bi-lateral supported projects were undertaken in Kenya during the past 15 years with the aim of reducing energy use and reliance on oil imports. During the 1980s, the World Bank was interested in assisting to find alternatives to oil in large industry. At that time, major industrial enterprises were surveyed and sensitised to energy conservation opportunities. The GOK, through the Ministry of Energy, undertook an industrial energy conservation programme in 1987 with support from Canada. This three year programme provided training to professional technical staff in large industries in the use of auditing equipment and procedures. A UNIDO supported energy conservation programme, executed by Kenyan engineers at the Kenya Association of Manufacturers (KAM) with the assistance of technical advisors, developed capability at KAM to provide energy efficiency consulting services while conducting energy audits at 30 SME.
6. There is due reference to environmental concerns in the GOK Sessional Paper No. 2 of 1996 on Industrial Transformation to the Year 2020. However, it is also clearly evident that the focus is on the local/national environment (i.e. sensory pollution). Therefore, environment related investments tend to deal with reducing SO<sub>2</sub> and TSP emissions by filtering techniques which do not affect CO<sub>2</sub> emissions. While there is reference to Agenda 21 in the Sessional Paper acknowledging the global environment, global issues clearly will not become a high priority due to lack of funds. Nonetheless, this proposal outlines an approach whereby Kenya can make effective use of global environment funds to build capacity and to demonstrate the national

economic benefits achievable by addressing international climate issues. The project will provide international technical assistance to support local institutions to remove barriers to widespread adoption of energy efficiency measures in Kenya's small and medium size enterprises.

## **2 RATIONALE AND OBJECTIVES**

7. The project is designed to remove barriers to energy efficiency while increasing the institutional capability to implement energy efficiency projects. The project will specifically address the following barriers: i) lack of experience in identifying energy efficiency options; ii) lack of information regarding the economic viability of energy efficiency measures; iii) lack of ability to develop bankable projects; iv) lack of ability to secure financing for profitable projects; and v) lack of institutional capacity to mainstream energy efficiency within the SME and financial communities. In particular, the project is designed to facilitate the learning process required for widespread application of energy efficiency and energy conservation activities in Kenya. The barriers addressed are common in many other African countries and there is significant scope for replicability.

8. Kenya is a signatory to the UN Framework Convention on Climate Change. Signed in June 1992 and ratified on 30th August 1994, the Convention entered into force for Kenya on 28th November 1994. The project activities respond to the GEF Operational Strategy for "Removal of Barriers to Energy Conservation and Energy Efficiency".

9. In anticipation of the Energy Sector Reform and Power Development Project, Kenya has undertaken some measures to improve its energy efficiency. On the supply side, Kenya Power & Lighting Company (KPLC) has recently carried out a loss reduction study to identify cost effective means to reduce distribution losses in the major load centres. On the demand side, the Kenya Industrial Energy Management Programme (KEMP), administered by KAM, focuses on the provision of information and energy audit services on a cost recovery basis. The proposed project would build on past experiences, provide new incentives, and finance activities to develop human and institutional capabilities to promote private sector participation and introduce energy efficient technologies. GEF support is needed to increase the awareness of SME that investing in energy efficiency is often the best economic choice and good business practice. The project will serve to catalyse this process.

10. The proposed project is designed to complement the national policy presented in *Sessional Paper No. 2 of 1996 on Industrial Transformation to the Year 2020* which was adopted by Cabinet in November 1996. The major purpose of the Sessional Paper is to set out national policies and strategies that will lay the foundation for the structural transformation required to enable Kenya to join the league of *Newly Industrialised Nations* by the year 2020. The Sessional Paper emphasises that the private sector must take the initiative to provide the investment in processing, manufacturing and service industries; to obtain appropriate technologies; and to develop efficient production that will bring about a competitive and export oriented industrial sector. This is the basis upon which KAM recently undertook the Kenya Export Development Support (KEDS) project with US AID support.

11. In reponse to the industrial transformation strategy shifting from regulatory intervention to promotion of market-driven private sector development, the GOK supports institutional strengthening at KAM. The strategy specifically aims at: i) building up the capabilities of enterprises to formulate and implement strategies and action programmes which will improve

their competitiveness and productivity; ii) building up the capabilities of Government to formulate and manage an overall strategy for industrial development within the framework of an open economy; and iii) strengthening the capability of both public and private sector actors to manage development resources within the constraints of the country. This organisational strategy emphasises assisting the private sector to develop efficient and competitive manufacturing and service industries.

12. The purpose of the project is to develop capacity: i) to identify appropriate energy efficiency and energy conservation measures; ii) to implement bankable projects; and iii) to pioneer, test and prove mechanisms for financing these projects. Sustainability will require that significant Kenyan private sector financial resources are invested. The accompanying donor support is intended to cover transaction costs during the period required for the SME and financial communities to become confident that investment in profitable energy efficiency measures makes good business sense.

13. The success of the project will be measured relative to several performance indicators, as follows.

- Enhanced capacity at KAM to develop and promote energy efficiency projects: KAM will establish a permanent group of energy professionals that will be positioned to continue industrial energy efficiency activities beyond the project execution period.
- Significant increase in energy efficiency investments within SME: It is anticipated that more than USD 4 million will be invested in financially attractive energy efficiency projects.
- Participation of local financial institutions: Local banks and other financial intermediaries will respond to the market demand by including energy efficiency loans in their lending portfolios.
- Viable energy service companies: The project will enable the emergence of ESCOs.

14. The project will be executed through four principal components: 1) Capacity Building and Awareness; 2) Overcoming Financial Barriers; 3) Demonstration Projects; and 4) Institutional Strengthening and Sustainability.

### **3 PROJECT ACTIVITIES AND EXPECTED RESULTS**

#### **3.1 Component 1: CAPACITY BUILDING AND AWARENESS IN INDUSTRY**

##### **3.1.1 Barriers**

15. SME owners and managers in Kenya tend to focus their efficiency improvement activities on the end-product (i.e. manufacturing process, production line improvements, service provision). The larger energy consuming SME do implement energy efficiency programmes; however, for the majority of SME, reducing energy cost at end-use has not traditionally been a principal concern. There is a need to make information more readily available to enable SME to incorporate energy planning in their business operations. Increased awareness and adoption of energy efficiency and energy conservation measures will be engendered by addressing the following specific barriers: i) lack of knowledge of energy efficiency opportunities and the availability of new technologies; ii) lack of capacity to undertake energy efficiency analysis; and iii) lack of awareness within SME of the simplicity with which energy saving measures can be effectively utilised to increase production and profitability.

### **3.1.2 Objectives**

16. The overall objectives of this activity are: i) to increase awareness among business owners and operators of the economic advantage to be gained through implementation of energy efficiency measures; and ii) to build capacity within the industrial and service sectors to respond in a way to obtain both local and global benefits from enhanced energy efficiency.

### **3.1.3 Description**

17. An assessment of the industrial structure and elaboration of a list of SME to be addressed by the project will be made, including indications of interest and readiness of related SME to receive professional advice in energy conservation and to carry out related measures/investments on a self-financed basis. An assessment will determine specific training needed to enhance the capability of local counterparts who act as local focal points for the implementation of the project, for distribution of related information and for training of local technicians/managers in energy conservation issues. This activity will lay the foundation for establishment of a national network of energy auditors. Orientation seminars will be arranged for leading personnel of participating enterprises to present energy efficiency and energy conservation opportunities in Kenya's manufacturing and commercial centres. These seminars will serve to introduce various energy saving technologies and equipment as well as indicate how these can be used to advantage in the enterprise.

18. A series of specialised training courses and workshops will be arranged at various manufacturing and commercial centres in Kenya, i.e. Nairobi, Mombasa, Thika, Kisumu, Kericho, Eldoret, Nakuru and possibly other centres. These courses will teach the fundamentals which are most necessary for the diligent application of the indicated energy saving measures. The implementation of the identified measures will be stressed, so as to reduce the level of uncertainty and apprehension which prevents adoption of these measures today. During the courses, the trainees will be expected to carry out case studies so as to be able to serve as local resource persons in subsequent courses.

19. An SME industrial energy efficiency network (IEEN) will be established and information will be disseminated through the network, encouraging open discussion of best practice. The main objective of the IEEN is to facilitate and encourage the decision-making processes with regard to energy efficiency in industry. The market analysis of the different industrial sectors will have defined the needs and obstacles with respect to energy efficiency in industry. A contact group will be established in each selected industrial sector to assist and advise on relevant topics regarding energy efficiency and energy bench-marking.

### **3.1.4 Outcomes**

20. Energy auditors will be trained and a national network of energy auditors will be established to ensure sustainability. These auditors will become skilled in identifying profitable energy efficiency initiatives. Many of these auditors will have acquired the skills necessary to participate in emerging Energy Service Companies (ESCOs), as described in Component 2.

21. An assessment of the potential for energy saving within SME will be conducted and reported. This assessment will indicate the most important technology mitigation measures and direct the scope of the training programme to be developed by the Project Management Unit (PMU).

22. Additional outcomes of this component will include: improved capacity in the identification, evaluation and preparation of energy conservation related measures; improved SME staff capacity in industrial effluent management; measurable increased level of awareness and increased capability to assess energy efficiency possibilities; and increased awareness of the financial opportunities available through investment in energy efficiency. One hundred professionals from SME will be trained in a series of seminars and workshops in practical methods and techniques for the preparation and execution of energy saving measures.

### **3.2 Component 2: OVERCOMING FINANCIAL BARRIERS**

#### **3.2.1 Barriers**

23. The low implementation rate of the recommendations of the past energy audits conducted in a number of energy efficiency programmes reveals the existence of funding problems and lack of incentives. Some recommended energy efficiency improvement measures required consumers to invest in retrofit measures or equipment which were difficult to justify economically. However, legislation introduced in the 1994-95 GOK budget speech removed duties and taxes on equipment that contribute to environmental improvement (including energy efficiency equipment) -- this has improved the investment situation somewhat. Nonetheless, barriers remain and this project component will seek to overcome the following: i) continuing lack of available self-finance within some SME sub-sectors; ii) lack of access to affordable financing (local credit is typically available at 22% to 37%); iii) lack of awareness within both the SME and financial communities of the favourable investment opportunities available through the implementation of energy efficiency measures; iv) lack of confidence that the calculated return on investment will be met -- arising from traditionally low energy costs; v) lack of knowledge of the availability of some alternative financing sources; and vi) lack of capability to prepare bankable project proposals.

#### **3.2.2 Objectives**

24. The objective of this activity is to assist the SME and financial institutions to apply economic and financial analyses appropriate for the implementation of profitable energy efficiency measures. Specifically, this project component will: i) develop business plans for environmental and energy efficiency actions; ii) indicate cost recovery mechanisms for energy efficiency measures; iii) assist enterprises to identify opportunities for leveraging additional financing for their projects through commercial financing sources and international assistance programmes; and iv) assess the risks associated with energy efficiency projects.

#### **3.2.3 Description**

25. The project will enable removal of the financing barriers by the preparation of a *Guide for Kenyan and Foreign Investors Participating in the Implementation of Energy Efficiency and Energy Conservation Projects*. The Guide will be a significant output of the project and will serve as a useful tool in subsequent implementation of energy efficiency investments. The indicative contents of the proposed Guide include the following: i) the legal basis for energy conservation investments in Kenya, including a list of the existing legislation and measures to improve the legislative basis for increased investment activity; ii) a description of the tax system, excise payments and applicable customs duties; iii) information regarding the financing of energy efficiency projects and the repayment of investments (Topics would include: sources of finance and guarantees; and financial mechanisms such as Third Party Financing and Energy Service Companies (ESCOs)); iv) the requirements of financial institutions on preparing and submitting

proposals for energy efficiency project financing; and v) procedures for development and implementation of energy saving projects in Kenya (including the project design process, the role of Kenyan agencies in project implementation, and mechanisms for cooperation with foreign partners). This Guide would be prepared during the first year of the project. A Summary of the Guide will be prepared for decision makers (i.a. financial institutions, local and national authorities, utilities, and donor and multilateral lending agencies) which are often unfamiliar with the merits of energy efficiency investments. As the planned demonstration projects are implemented (under Component 3); the results would be presented in the form of Proof of Concept projects and annexed to the Guide. The Guide would be updated, as appropriate, and serve to ensure sustainability. The PMU would be responsible to maintain the Guide. The terms of reference for the local and international consultants will include this activity.

26. A financial engineering course will be developed and delivered by the PMU to prepare the SME to collaborate in the projects identified in the energy audits. This course will take the participants through the process from energy audit to investment plan development to bankable proposal preparation. The course will provide a structure within which the training in financial analysis will be delivered. Candidates for this training programme will arrive with projects identified during the energy audit phase and which are likely to be implemented as demonstration projects. The candidates will be selected on a competitive basis in accordance with criteria to be agreed by the Project Steering Committee. Suggested criteria are presented in the demonstration project component. GEF support will provide financial and technical assistance for the development of model investment plans and the preparation of bankable proposals, which constitute principal outputs of the financial engineering course. This investment plan development assistance will be provided to the selected enterprises on a cost-sharing basis to encourage only those enterprises that have a serious intent in following up their business development with concrete action. The financial engineering course will be offered once per year during years 2, 3, and 4 of the project.

27. Energy Service Companies (ESCOs) can play an important role in reducing the energy use of SME and the project will create a framework through which viable and entrepreneurial ESCOs can emerge. Certain models are being explored and have received favourable response from the stakeholders during project preparation -- particularly, financial institutions and management consulting/auditing firms which recognise new business opportunities arising from investment in energy efficiency measures. A form of the traditional performance-based shared savings contract is favoured. The GEF project will provide support to enable ESCO establishment. The project budget includes an amount to cover consulting and training services by internationally recognized ESCOs to assist qualified Kenyan firms to develop their capacity to act as local ESCOs.

28. The financial sector is well established in Kenya. It comprises more than 100 financial institutions; and many of them administer a number of special loan programmes which are dedicated to the development of SME. The European Investment Bank has provided a line of credit through a Global Private Enterprise Loan Programme. Loans are available through several Kenyan financial institutions for the type of energy efficiency projects that are envisaged. The EIB programme offers Kenya Shilling loans at slightly below market rates and US Dollar loans at internationally competitive market rates for export oriented enterprises. In addition, several banks are considering involvement in the IFC/GEF SME Programme which can offer concessionary financing for the types of energy saving investments envisaged within



this project. The PMU will work with local financial intermediaries and management consulting firms, which have experience with these specialized financial programmes, to develop appropriate financing packages for SME investment in energy saving projects.

29. The PMU will collaborate with the KPLC Efficiency Improvement Unit in the identification of possible energy efficiency investment projects. Specifically, KAM's experience with SME within the KEMP and KEDS projects has provided in-depth understanding of the operation and energy problems faced by SME which have not until now been addressed by KPLC, which typically focuses on large scale enterprises. In addition, activities within this GEF supported project would complement those planned within the WB Energy Sector loan project.

#### **3.2.4 Outcomes**

30. *A Guide for Kenyan and Foreign Investors Participating in the Implementation of Energy Efficiency and Energy Conservation Projects* will be produced.

31. Financial engineering courses will be delivered to produce bankable investment projects which are acceptable to financial institutions. The project will assist SME to secure financing for their energy efficiency investment projects.

32. An enabling environment will be established to allow the emergence of ESCOs which will provide expert engineering and financial services on a shared energy saving basis.

33. Due to the market orientation of the project, SME will become more financially self-reliant and will become more proactive in seeking technical and financial assistance to overcome market barriers.

### **3.3 Component 3: DEMONSTRATION PROJECTS**

#### **3.3.1 Barriers**

34. Following the preparation of bankable project proposals, including securing financial commitments, a series of demonstration projects will be undertaken to illustrate the potential for real energy and cost savings through energy efficiency measures. These demonstration projects will address the following barriers which prevent the implementation of profitable projects: i) lack of success stories; ii) lack of confidence to invest in energy efficiency and conservation initiatives; iii) lack of experience incorporating energy cost savings in business planning; and iv) lack of experience financing and paying for energy and environmental improvement services.

#### **3.3.2 Objectives**

35. The overall objective of this activity is to promote the sustainability of the energy efficiency management programme undertaken within this GEF supported project by providing demonstrable results which can be widely replicated throughout Kenya. Specifically, this activity will seek: i) to apply the knowledge and awareness gained in the previous activities and to implement viable energy efficiency projects; ii) to secure financing for energy efficiency projects; and iii) to illustrate to the SME and financial communities that environmentally sound investments in energy saving measures can be cost-effective and profitable.

#### **3.3.3 Description**

36. KAM experience with a limited number of energy saving projects during the past ten years indicates that most SME can benefit from short payback period energy efficiency



Measures															
Peak demand regulator	•	•	•	•	•	•	•	•	•	•	•	•	•	•	14
Heat pumps														•	1
High efficiency lights	•	•	•	•	•	•	•	•	•	•	•	•	•	•	14
Compressed air leaks	•	•	•	•	•	•	•	•	•						9
Compressed air cleaner				•	•	•									3
Desiccant air dryer	•	•	•		•	•	•	•	•						8
Efficient compressor		•	•		•	•		•	•						6
Make up water heating	•	•	•	•	•	•	•	•	•		•	•			11
Cooling water recovery		•	•		•	•									4
Local insulation mat'ls	•	•	•	•	•	•	•	•	•	•	•	•			12
Prewash water recovery	•	•	•												3
Flow limitation devices													•	•	2
Waste hot air recovery							•	•	•	•	•	•			6
Flue gas recovery														•	1
Flash tank for LP steam	•	•	•					•	•						5
Borehole H <sub>2</sub> O treatment	•	•	•	•	•	•		•	•						8
Wood fuel combustion											•	•			2
Wood chips burner												•			1
High efficiency motors		•	•	•	•	•		•	•		•	•			9
Variable speed drives		•	•	•	•	•		•	•		•	•			9
Energy management software	•	•	•	•	•	•	•	•	•	•	•	•		•	13
Window microswitches													•	•	2
Steam turbine		•	•		•	•		•	•		•	•			8
Various other measures	•	•	•	•	•	•	•	•	•	•	•	•	•	•	14
<b>INVESTMENT (mKSh)</b>	5.3	19.3	23.3	8.1	28.2	37.3	9.2	18.6	24	7.7	37.7	37.7	3.2	7	266
<b>PAYBACK (years)</b>	2.6	3.8	4.6	2.1	3.3	4.4	1.7	2.0	2.6	2.7	2.5	3.9	2.3	3	
<b>Annual energy saving (Terajoules per year)</b>	3.2	6.6	14.3	5.7	11.6	13.0	9.5	13.8	26.7	6.1	10.4	49.7	0.4	1	172
<b>Annual CO<sub>2</sub> savings (tonnes per year)</b>	243	462	1430	536	1090	1222	759	1102	2133	649	1107	5291	17	35	16100

40. Any energy efficiency investments sponsored by the project will undergo extensive financial viability analysis. Only investments that are expected to be financially sustainable in accordance with the data provided in Table 2 will be included in the project. Limited GEF financing on the order of approximately 15% of the investment costs will be provided to cover initial incremental transaction costs and additional performance monitoring expenditures. Verified energy savings data are needed to allow the dissemination of project results to other interested SME and to encourage wide replication beyond the GEF project. This process will be standardised to facilitate replication of small investment projects. Energy performance and verification programmes will be established to determine the actual savings arising due to the investments. The energy savings will be used to estimate GHG emission reductions. The four contractual arrangements for measurement and verification of savings from the International

Performance Measurement and Verification Protocol (IPMVP) will be carefully evaluated and adapted to Kenyan conditions for this purpose.

**Table 2. Energy Conservation Potential in Selected SME Sub-Sectors**

Sub-sector Energy sources	Sites in sub- sector	Total annual energy use in sub- sector (TJ)	Energy saving (%)	Annual energy saving (TJ)	Annual CO2 savings (t/yr)	Annual energy cost savings (mill. KSh)	Total investment required (mill. KSh)
<b>Food &amp; Beverage</b>	140						
Electricity		1,260	28	353	8,098	461	
Fuel oil		3,800	18	684	52,335	322	
Wood fuel		1,900	20	380	45,600	35	
<b>Total</b>		<b>6,960</b>		<b>1,417</b>	<b>106,033</b>	<b>818</b>	<b>2,590</b>
<b>Textiles</b>	45						
Electricity		700	18	126	2,892	165	
Fuel oil		2,000	11	220	16,833	104	
Wood fuel		3,100	16	496	59,520	46	
<b>Total</b>		<b>5,800</b>		<b>842</b>	<b>79,245</b>	<b>314</b>	<b>918</b>
<b>Paper Products</b>	29						
Electricity		1,060	5	53	1,217	69	
Fuel oil		1,500	16	240	18,363	113	
Wood fuel		600	16	96	11,520	9	
<b>Total</b>		<b>3,160</b>		<b>389</b>	<b>31,100</b>	<b>191</b>	<b>360</b>
<b>Tea</b>	80						
Electricity		630	18	113	2,603	148	
Fuel oil		2,100	15	315	24,102	148	
Wood fuel		4,100	34	1,394	167,280	130	
<b>Total</b>		<b>6,830</b>		<b>1,822</b>	<b>193,985</b>	<b>426</b>	<b>1,816</b>
<b>Hotels</b>	326						
Electricity		480	28	134	3,085	175	
Fuel oil		365	23	84	6,423	40	
<b>Total</b>		<b>845</b>		<b>218</b>	<b>9,508</b>	<b>215</b>	<b>1,076</b>
<b>Grand Total for 5 sub-sectors</b>		<b>23,595</b>		<b>4,688</b>	<b>419,871</b>	<b>1,964</b>	<b>6,760</b>
<b>Total for all SME</b>		<b>80,000</b>		<b>16,000</b>	<b>1,400,000</b>	<b>6,500</b>	<b>23,000</b>
<b>20% penetration</b>		<b>16,000</b>		<b>3,200</b>	<b>280,000</b>	<b>1,300</b>	<b>4,600</b>

Currency conversion factor: 1 USD = 60 Ksh

41. The data in Table 2 are used to determine the potential for replicability of the demonstration projects. The total annual energy use for the five sub-sectors of 23,595 TJ is approximately 30% of the energy consumption reported in the 1994 energy balance for their respective sectors. Since the selected sub-sectors are a representative cross-section of Kenya SME, it is reasonable to assume that the total SME energy conservation potential can be obtained by dividing “Grand Total for 5 sub-sectors” by 30% to yield the “Total for all SME”. The last line in Table 2 then indicates the values based on an assumed 20% penetration rate. Assuming that 20% of SME invest KSh 4,600 m (US\$ 76m) to reduce their CO<sub>2</sub> emissions by a

total of 280,000 tonnes per year during 15 years, then the total CO<sub>2</sub> emission reduction would be 4.2 million tonnes. At the GEF project support cost of US\$ 3.6 m, the cost of avoided CO<sub>2</sub> emissions will be about US\$ 0.85 per tonne.

### **3.3.4 Outcomes**

42. Demonstration projects will be implemented to test and prove the new financial mechanisms developed under Component 2. Significant energy savings and CO<sub>2</sub> emission reductions will be attained as a result of the demonstration projects.

43. Measurement of the energy savings and environmental impacts of the demonstration projects will be undertaken by the PMU, who will adopt the IPMVP methods for use in Kenya. This will provide a database of successful projects as well as feed back lessons learned from the demonstrations for widespread dissemination through the SME network.

## **3.4 Component 4: INSTITUTIONAL STRENGTHENING AND SUSTAINABILITY**

### **3.4.1 Barriers**

44. There is a shortage of qualified personnel in Kenya to effectively manage this project. Institutional strengthening at KAM will be required to ensure successful project execution.

### **3.4.2 Objectives**

45. The overall objectives of the institutional strengthening activity are: i) to enhance the capability of the members of the Project Management Unit (PMU) to effectively execute the project; ii) to provide the PMU with capacity to identify the needs of SME so as to encourage them to address energy efficiency and environmental issues; and iii) to develop capacity to coordinate the efforts of stakeholders involved in energy efficiency initiatives.

### **3.4.3 Description**

46. Institutional strengthening of the PMU will involve technical, economic, financial and managerial training. This training will be undertaken in parallel with the previously described project activities. The technical staff will participate in various specialised training courses on energy management and environmental conservation targeted to small and medium sized enterprises. Specialised technical courses on international best practice in energy efficiency will be attended at qualified institutions within Kenya, the African region and internationally.

47. This training will be obtained through a combination of short-term and medium-term intensive courses; study tours; participation in and contributions to international conferences; and short-term and medium-term secondments. Full-time international technical assistance will support the PMU in the early stages and provide back-stopping throughout the project. The training will strengthen the capability of the PMU to effectively manage the activities under Components 1, 2 and 3 of the project.

48. The PMU will undertake to prepare a framework within which to identify and assess the most promising energy efficiency options. Within this activity, they will: 1) prepare an energy use database of the major industrial sub-sectors; 2) determine the energy reduction potential related to specific replicable energy efficiency measures; 3) determine the profitability of the most attractive measures based on cost savings; 4) determine the profitability of the most attractive measures based on GHG emission reductions; and 5) create a methodology for establishing incremental costs and encouraging enterprises to select measures related to GHG emission reductions. Having established a viable framework, the PMU will suggest approaches

whereby the database of information can be used to identify financing mechanisms for the implementation of profitable demonstration projects.

49. With a focus on developing bankable energy efficiency projects, the PMU will assemble information on the current status of energy policy, energy supply, energy pricing, status of environment awareness and global climate with respect to energy consumption, as well as the status of implementation of national policies and strategies for reduction of energy utilisation and related environmental impacts. A paper will be prepared detailing the reforms in energy and environment policy required, including incentives needed to ensure satisfactory and sustainable implementation of energy efficiency projects.

#### **3.4.4 Outcomes**

50. The PMU will develop skills to facilitate the introduction and adoption of energy efficiency measures within SME. KAM staff have worked on analogous projects and have a basic understanding of the economic, social and political constraints which inhibit investment in energy efficiency projects. After receiving the appropriate training, they will be able to use their enhanced experience to more effectively identify potential investment projects, to understand and respond to the needs of the SME, and to promote stakeholder involvement.

51. The PMU located at KAM will become a centre of energy efficiency excellence which: i) has expertise and knowledge of energy technology and financing options; ii) maintains a database of industrial energy use and energy efficiency activities; iii) produces educational, promotional and awareness materials; iv) has training facilities; v) assists Government in the formulation of energy and environment policy; and vi) provides information useful to Government in its reports to the UN FCCC.

#### **4 Risks and Sustainability**

52. A significant risk associated with this project is the growing crisis of governance in Kenya. However, it is important to note that recently a general election took place and a new parliament has been successfully convened. In addition, economic restructuring with assistance of the IMF is underway; and the outcome may affect the project. It is clear that this GEF supported project will intervene at a critical point in Kenya's industrial transformation process; and it has been specifically designed for active participation of the private sector to ensure sustainability. The project will build on the success and lessons learned of related donor and GOK supported activities during the past ten years. It is consistent with the national government policy aims indicated in Sessional Paper No. 2 of 1996 on Industrial Transformation to the Year 2020 -- which has already set out the framework for industrial development. The project will respond to the policy aims by assisting private enterprises to develop in a new market-oriented environment.

53. The Kenya Association of Manufacturers is a highly credible business association in Kenya and has been strategically selected by the the Ministry of Industrial Development to execute the project. Within its capacity as PMU, KAM will be well placed to directly impact the viability and business sustainability of its membership. This will be achieved through development of expertise and the establishment of project development capacity within the energy professionals community. Sustainability of the project beyond this GEF supported phase is expected because the project will provide commercial services for which, after successful demonstration, there will be a continuing demand. In particular, a network of energy auditors will be trained and energy professionals will become skilled in implementing profitable energy

efficiency measures. The energy service expertise created with project support will enable greater market penetration beyond the initial demonstration projects because this expertise will increasingly be provided on a fee-for-service basis as the economic benefits become apparent to the SME owners and operators. The national economic situation may influence the emergence of viable ESCOs. Nonetheless, while ESCO establishment is a desirable outcome of the project, they are not necessary to achieve the anticipated energy efficiency savings.

54. Foreign experts will be recruited to provide technical assistance to KAM throughout the project execution period. These will include one full-time specialist stationed in Nairobi during the first 2 years; and short-term specialists throughout the five years. These experts will have proven capability in the development and implementation of bankable energy efficiency projects. They will be results-oriented and impart their experience to their Kenyan counterparts.

## **5 Stakeholder Participation and Implementation Arrangements**

55. The Kenya Association of Manufacturers (KAM) has been an effective representative of Kenyan industry for almost 40 years. Its membership of 600 enterprises accounts for 70% of Kenya's formal sector industrial enterprises. The Association is well placed to provide an essential link for co-operation and communication between Government and the manufacturing and service sectors; and it is in a position to effectively approach its members and non-members. In the past, KAM has received modest support from donors which has resulted in two full-time professionals working in KAM to provide energy audit services on a fee-for-service basis. The present proposal is intended to enable KAM to go beyond this meagre provision of services to the next level of encouraging active investments in improved energy efficiency.

56. The Project Management Unit (PMU) will be located at KAM and staffed by permanent and experienced KAM employees. In addition, specialised external local consultants will be engaged as members of the PMU to provide short-term expertise as required. The PMU will be supported by international technical advisors, as needed.

57. The project design requires that KAM establish a Project Steering Committee (PSC) with representatives from the stakeholders and UNDP. Other donors will be invited to participate in the PSC. In addition, the PSC will include representation by the Ministries of Industrial Development, Energy, Environment & Natural Resources, Agriculture, Finance, and Technical Training, as well as industry representatives.

58. The UNDP will engage the services of an international consulting firm to support the PMU. In the selection of contractors, preference will be given to bids from consortia made up of traditional engineering consultants and firms with substantial experience operating as ESCOs.

59. The PMU will work directly with SME and also with SME associations, who will be fully informed and assist the PMU to achieve the desired benefits for association members. KAM, as the executing agency, will take the co-ordinating role for enterprise audits and realisation of the seminars and workshops. The actions and activities of KAM will affect not only those SME directly involved in the project but also industrial sectors of Kenya as a whole by sharing the experience of successfully implementing bankable energy projects.

60. The project will be implemented during a five year period according to the following timeframe.

- Component 1: Capacity Building and Awareness -- Months 3 to 60

- Component 2: Overcoming Financial Barriers -- Months 4 to 48
- Component 3: Demonstration Projects -- Months 13 to 60
- Component 4: Institutional Strengthening and Sustainability -- Months 0 to 60. Detailed project design and workplan will be developed during months 0 to 3.

## **6 Incremental Costs and Project Financing**

### **6.1 Incremental Costs**

The project's incremental cost matrix is shown as Annex 1.

### **6.2 Project Budget and Financing**

61. The total project cost is USD 8.643 million, of which USD 3.513 million is sought from the GEF. The requested GEF funding is for: 1) awareness and dissemination activities; 2) capacity building to overcome technical and financial barriers; 3) financial support to cover the incremental costs of economically viable projects; 4) a portion of the cost of the locally engaged Project Management Unit; and 5) the cost of international technical assistance. UNDP Nairobi will contribute US\$ 0.5 million to the PMU support costs. Expressions of interest to support the project have been received from several bi-lateral donors. Any additional such support would be used to create greater market penetration by supporting financially favourable demonstration projects.

## **7 Monitoring, Evaluation and Dissemination**

62. The success of the project will be measured in terms of the quality and replicability of investments made within the SME sub-sectors which exemplify energy efficiency improvements.

63. Periodic progress reports, annual reports and a project final report will be prepared for the consideration of all stakeholders at the review meetings. Reports will be prepared in draft form and circulated in advance to allow review and technical assessment prior to the review meeting.

64. There is a national "Energy Task Force" which reviews all GEF energy sector projects. The project coordinator will continue to provide monthly updates to this panel for review during the monthly task force meetings. (The membership list of the Task Force is attached). There is an external GEF evaluation committee that will also provide necessary additional evaluation and dissemination services to this project.

65. KAM will establish the project bank account in a commercial bank on terms and conditions satisfactory to the UNDP. Withdrawals from such an account will be made only to pay for project costs. KAM will make deposits in Kenya shillings to this account for all monies accrued from the audit services provided to clients and any other donations in local currency.

66. The UNDP will manage the foreign accounts.

67. **Technical Review:** A draft version of this proposal was reviewed by Dr. Ashok Gadgil. He recommended that the brief should be reformulated and suggested the need for data such as examples of potential energy savings from improved efficiency in specific industrial plants based on past KAM audits, estimate of the number of demonstration projects to be supported by GEF fund and the size of expected annual savings. The draft proposal was subsequently revised in the light of the technical reviewer's comments. The revised draft was sent back again to Dr. Gadgil and his latest review, attached as Annex 3, provides further useful comments which are reflected in the present brief. The reviewer particularly raises concern regarding the sustainability of energy



efficiency activities within SME beyond the project. This final version of the proposal has been edited to more clearly indicate that sustainability will be predicated on adoption of energy efficiency business activities by energy professionals who will increasingly undertake this work on a fee-for-service basis. The Ministry of Industrial Development supports the initiative of KAM to undertake and execute the project; however, it is also clear that replicability of the planned demonstration projects will depend on the ability and skills of the energy professionals, trained within the project, to satisfy increasing market demand for their services.

### Component Financing

Component	GEF	SMEs	UNDP	Total
<b>1. Capacity Building and Awareness</b>				
Specialised training courses	130,000			130,000
Regional energy auditing workshops	130,000			130,000
Combustion efficiency equipment	110,000			110,000
Energy efficiency network development	<u>110,000</u>			<u>110,000</u>
<b>Sub-total</b>	<b>480,000</b>			<b>480,000</b>
<b>2. Overcoming Financial Barriers</b>				
Guide for Investors	250,000			250,000
Financial engineering courses, including business plan development and bankable proposal preparation	450,000	40,000		490,000
Development of financial mechanisms	100,000			100,000
ESCO development (TA & twinning costs)	<u>270,000</u>			<u>270,000</u>
<b>Sub-total</b>	<b>1070,000</b>	<b>40,000</b>		<b>1110,000</b>
<b>3. Demonstration Projects</b>				
Investments		4,400,000		4,400,000
Measurement, verification, & dissemination of lessons and experiences	<u>800,000</u>			<u>800,000</u>
<b>Sub-total</b>	<b>800,000</b>	<b>4,400,000</b>		<b>5,200,000</b>
<b>4. Institutional Strengthening, Sustainability</b>				
PMU Staff				
Specialised short courses	80,000			80,000
study tours	60,000			60,000
international conferences	40,000			40,000
secondments	50,000			50,000
energy use database		<u>50,000</u>		<u>50,000</u>
<b>Sub-total</b>	<b>230,000</b>	<b>50,000</b>		<b>280,000</b>
<b>Project management and support</b>				
Project Management Unit	300,000		500,000	800,000
International Project Mgt.	200,000			200,000
Office Expenses	100,000	100,000		200,000
Project vehicles/maintenance (2)	130,000			130,000
Project preparation costs			40,000	40,000
Overall Project Monitoring & Evaluation	<u>100,000</u>			<u>100,000</u>
<b>Sub-total</b>	<b>830,000</b>	<b>100,000</b>	<b>540,000</b>	<b>1,470,000</b>
Project Support Services (3%)	103,000			103,000
<b>TOTAL Costs (USD)</b>	<b>3,513,000</b>	<b>4,590,000</b>	<b>540,000</b>	<b>8,643,000</b>

## **Annexes**

*(included in printed version)*

- I. Incremental Costs
- II. Project Planning Matrix (Logical Framework)
- III. STAP Technical Review

*(included in electronic version or to be provided by the IA upon request)*

- IV. Project Schedule
- V. List of Project Stakeholders Consulted during Preparations. The table provides names of Stakeholders involved in the project.
- VI. Classification of Small and Medium Enterprises. This annex provides a classification of Small and Medium Scale enterprises in Kenya which are divided into two groups: Manufacturing and Service enterprises which are in turn subdivided into seven and four groups respectively.
- VII. Audit results of the Kenya Energy Management Programme (KEMP). This annex provides the amounts of energy efficiency investment required by five enterprises which undertook to improve their energy efficiency by implementing cost effective measures as recommended by KAM.
- VIII. Analysis of Energy Savings and Financing. This annex provides information on applicability of energy efficiency projects, savings in Ksh and Toe, investment required and payback period in years, for sample small and medium scale enterprises.
- IX . Government Support Letter.

## **Annex I**

### **Incremental Costs**

#### **Broad Development Goals**

The provision of adequate energy for the growth of Kenya's industrial sector is the broad development goal of this project. At present, there is a serious shortfall in electrical power generation. This project will not only help bring the peak electrical demand in line with generation capacity but also it will assist small and medium enterprises to reduce production costs through increased energy efficiency, thereby increasing profits.

#### **Baseline**

An assessment of the current situation points to several barriers which prevent the significant energy conservation potential of small and medium enterprises in Kenya from being achieved. The first is a lack of awareness and information about the potential benefits of increased energy efficiency. Although limited energy efficiency activities have been undertaken in Kenya; it has been a relatively small amount and it has not been conducted systematically. A second barrier resulting in this limited follow-up is the limited capability among small and medium enterprises to obtain financing for energy efficiency investments. Personnel have received insufficient training linking the physical parameters and possibilities of energy conservation with the preparation and financing of profitable investments. At present, financing energy efficiency projects is restricted to a few enterprises, most of which are either larger subsidiaries of international companies or have been involved in subsidized donor-funded activities. Local financial institutions are unaware of the significant potential market related to investing in energy efficiency; and are unfamiliar with financial mechanisms which can open this market. A third barrier that hinders the development of more energy efficient industry is the limited number of actual demonstrations of enhanced energy efficiency through investment. While many firms have taken "no" or "low" cost housekeeping measures, very few have undertaken the investments in new plant capacity to improve energy efficiency and therefore, profitability. The recommendations of past audits have only been followed in a limited number of cases; and there is a need to develop more success stories to engender confidence within the SME community to invest in such projects on their own financial merit. Finally, Kenya possesses few, if any, institutions to develop sustainable energy efficiency activities. This is exemplified by a lack of dedicated policy and guidelines, a lack of knowledge of international best practice, and a lack of capacity to implement energy efficiency measures. In the absence of this GEF supported project, the pattern of minimal to modest energy efficiency improvement is likely to continue.

Small and medium scale enterprises in Kenya utilise a supply-side approach to energy use. They focus on utilizing the cheapest fuel rather than minimising energy costs per unit of output. There is a general lack of knowledge of life-cycle economic and financial analyses methods and their application to energy use within industry. The project seeks to widen this perspective and reshape the decision making framework as applied in SME in Kenya.

#### **Global Environmental Objective**

The global environmental objective of this project is the reduction of GHG emissions from the small and medium-sized industrial enterprises. This objective will be achieved by removing the four barriers that have been identified to the improvement of the efficiency of energy-use in this sector (see below). This is consistent with the goals and guidelines of GEF Operational Program 5 Removing Barriers to Energy Conservation and Energy Efficiency.

## **Alternative**

### *Component 1: Capacity Building and Awareness Raising*

This component will address the training needs of SME personnel who will be involved in energy efficiency activities. Training will be delivered by local, regional and international specialists. Throughout the project, the training materials will be turned over to Kenyan institutions to enhance their capacity to provide future training thereby ensuring sustainability. The training of SME personnel will be delivered through energy auditing workshops and specialised courses for energy managers. This training will be designed to raise awareness of potential energy conservation measures and to instill capacity to implement energy efficiency measures. An industrial energy efficiency network will be established in the later years of the project to encourage and facilitate dialogue among energy managers.

### *Component 2: Removing Financial Barriers*

This component will facilitate financing of energy efficiency activities through a variety of training and business development means. Specific activities will include financial engineering courses, business plan development, and bankable proposal preparation. The project will enable the emergence of energy service companies. Specific training will be offered through specialised short-courses, workshops and seminars; and delivered to all relevant stakeholders including, project engineers, SME owners, financiers, and equipment suppliers. The principal output of this project component will be the development of fundable project proposals utilizing new financing mechanisms. These schemes will address the institutional, policy and legal aspects of energy efficiency investments, with a focus on indicating profitable investments. Enterprises will receive training in market analysis and financing methods which will lead to the realisation of bankable projects. Financial engineering courses will be offered to train SME personnel and other project developers in the conduct of life-cycle energy and economic analysis, including environmental considerations. In addition, the relevant information needed by potential investors will be assembled in a Guide for Investors -- which will cover legal, financial, and project development concerns.

### *Component 3: Financing and Implementing Demonstration Projects*

The transaction costs associated with developing demonstration projects will be covered by the previous project components. In addition, the GEF support will provide a portion (up to 20%) of the costs of between 12 and 15 demonstration installations to cover the incremental costs and ensure financing of a selected number of demonstration projects. The demonstration projects, as outlined in the body of the text, will be selected on the basis of past performance, potential energy savings, willingness and ability of the enterprise to obtain the additional necessary funds from other sources, potential replicability, and potential GHG savings. These projects will be executed along the lines of small-scale projects; and funds will be released to cover the incremental costs of

the demonstrations, which are largely anticipated to be learning-related costs. The demonstration installations, to be selected by the steering committee, will be expected to share information about performance freely.

#### *Component 4: Institutional Strengthening and Project Management*

One purpose of this component is to strengthen the PMU to undertake and effectively execute the five year project. Ultimately, this capability will be established at KAM to enable it to become a focal point for energy efficiency activities in Kenya. This will be accomplished through formal training in Kenya and abroad, as well as through on-the-job training through the resident international technical adviser. Having developed the fundamental capability to assess energy and global environmental issues, the PMU will be well placed to perform GHG emission inventories, contribute to national energy and environment policies, and establish guidelines for the implementation of globally beneficial energy efficiency measures.

#### **Incremental Cost Matrix**

The incremental costs and benefits for each project component are summarized in the incremental cost matrix (Table I-1). For Component 1, awareness of energy efficiency as a “win-win” proposition would remain at a low level without the project. After project completion, there should be greater understanding among SME operators of both the economic and environmental benefits of improving energy efficiency. For Component 2, SME’s would remain unable to obtain financing for energy efficiency projects in the baseline, whereas in the project case, they are trained to prepare projects for financing. In the baseline, a limited number of energy efficiency projects would be financed because of the limitation on know-how for financing and implementing energy-efficiency projects. Under Component 3, the project will select about 14 demonstration projects for partial GEF financing and assist in obtaining the requisite financing from other sources. Cost recovery and careful monitoring of costs and energy consumption will be an essential part of the demonstrations. This will help propel SME’s in Kenya toward greater investment in energy efficiency. Finally, under the baseline, the institutional arrangements in Kenya are not particularly favorable for investing in energy efficiency. Under Component 4, energy service providers and other institutions will be strengthened to be able to support investments in increased energy efficiency.

In summary, under the baseline conditions, the limited human resource base, the weak institutional structure, and the limited capabilities of the financial sector to evaluate and provide loan financing for energy efficiency investments will continue to constrain the energy efficiency of the small and medium enterprise sector. There would be few energy efficiency investments undertaken in this sector, and its GHG emissions would continue to grow. At present, the emissions from this sector are estimated at 7 m tonnes/year of CO<sub>2</sub> and emissions are expected to increase steadily with the growth of the SME sector.

Under the project case, the identified barriers are removed and energy efficiency investments begin to occur. These investments will result in energy savings, reduced CO<sub>2</sub> emissions and some peak demand reduction from the SME sector. Under the project case, about 20% of the SME’s in Kenya could be encouraged to improve their efficiency of energy use by 20%, which would account for a reduction of 280,000 tonnes of CO<sub>2</sub> emissions per year.

**Table I-1 Incremental Cost Matrix**

<b>Component</b>	<b>Baseline</b>	<b>Alternative</b>	<b>Increment</b>
<b>1. Capacity Building &amp; Awareness Raising</b>	<b>Global:</b> SME's emit GHG's-- unaware of "win-win" nature of energy efficiency	<b>Global:</b> SME's see environmental potential of energy efficiency	<b>Global:</b> SME's view energy efficiency as "win-win" proposition
	<b>Domestic:</b> Little or no awareness of energy efficiency	<b>Domestic:</b> SME's see economic potential of energy efficiency	<b>Domestic:</b> Awareness of economic potential for energy efficiency
	<b>Cost:</b> -0-	<b>Cost:</b> US\$480,000	<b>Cost:</b> US\$480,000
<b>2. Removing Financial Barriers</b>	<b>Global:</b> SME's cannot prepare & obtain financing for energy efficiency projects	<b>Global:</b> SME's taught how to prepare proposals and obtain financing for energy efficiency projects	<b>Global:</b> SME's prepare "win-win" energy efficiency projects
	<b>Domestic:</b> few, if any, energy efficiency investments made	<b>Domestic:</b> financial sector expands its capability to loan	<b>Domestic:</b> Profitable energy efficiency loans made
	<b>Cost:</b> US\$40,000 (SME's)	<b>Cost:</b> US\$ 1,110,000	<b>Cost:</b> US\$1070,000
<b>3. Financing &amp; Implementing Demo Projects</b>	<b>Global:</b> Few, if any, financed energy efficiency projects implemented	<b>Global:</b> Energy efficiency demos partly financed from GEF-- financing & cost recovery critical	<b>Global:</b> Financing of "win-win" projects demonstrated widely
	<b>Domestic:</b> Few, if any, energy efficiency loans undertaken	<b>Domestic:</b> SME's and financial institutions learn to prepare & process energy efficiency loans	<b>Domestic:</b> Energy Efficiency loans made available
	<b>Cost:</b> US\$4,400,000 (SME's)	<b>Cost:</b> US\$5,200,000	<b>Cost:</b> US\$800,000
<b>4. Institutional Strengthening &amp; Project Mgt</b>	<b>Global:</b> Kenya retains weak institutional structure for energy efficiency	<b>Global:</b> Institutions strengthened for "win-win" projects	<b>Global:</b> ESCO's and energy efficiency projects operate
	<b>Domestic:</b> Weak institutional framework & project mgt capabilities	<b>Domestic:</b> Project implemented	<b>Domestic:</b> Institutions possess ability for "win-win" projects
	<b>Cost:</b> US\$540,000(UNDP); US\$150,000(SME's)	<b>Cost:</b> US\$1,853,000	<b>Cost:</b> US\$1,163,000
<b>TOTAL PROJECT Global Environmental Benefits</b>	SME's emit a growing GHG emissions Barriers prevent investment in increased energy efficiency; Projected Emissions from SME Sector: 7m tonnes CO <sub>2</sub> /yr	Barriers to increased energy efficiency removed Significant CO <sub>2</sub> emission reductions will be achieved Potential Emissions from SME Sector: 6.6m tonnes CO <sub>2</sub> /yr	Barriers to energy eff. removed CO <sub>2</sub> savings from SME Sector will accrue Potential Emission reductions of up to 280,000 tonnes CO <sub>2</sub> /yr
<b>Domestic Benefits</b>	Limited energy efficiency investments and weak energy efficiency industry Electricity outages common Little or no attention paid to local air pollution from SME's	Energy efficiency investments common-- energy efficiency industry grows Industry begins to shave peak demand Local pollution from SME's reduced	Energy efficiency improves  Peak demand reduced Local pollution reduced
<b>Cost</b>	US\$ 4,590,000 from SME's US\$ 540,000 from UNDP	US\$ 8,643,000 total, including baseline funding plus GEF and UNDP contribution	US\$ 3,513,000 requested from GEF

### Annex II – Logical Framework

<b>Summary</b>	<b>Objectively Verifiable Indicators</b>	<b>Means of Verification</b>	<b>Critical Assumptions and Risks</b>
<b>Global objective</b> is climate stabilisation by reducing CO <sub>2</sub> emissions	Quantified CO <sub>2</sub> emission reductions	National GHG inventories and reports to UNFCCC	Consistency with GOK policy
<b>Specific objective</b> is removal of barriers to increased energy efficiency in SME	Identified barriers to energy efficiency removed	Evaluation reports	GOK policy which facilitates SME investment in energy efficiency projects
<b>Output 1</b> <b>Capacity Building among SME; and increased awareness of energy efficiency possibilities</b>	Assessment of SME structure; Training programme prepared and given to qualified SME staff; identification of interested SME; training needs assessment;	SME sub-sectoral structure identified; Review and Evaluation Reports; expression of interest by SME; increased SME enquiries regarding energy efficiency opportunities; increased capacity to develop energy efficiency projects.	SME participation; availability of financial resources; energy efficiency becomes a higher priority among SME;
<b>Activity 1.1</b> Specialised short courses	Training manuals; 100 trained professionals; energy auditors trained and accredited.	Training reports; Increased number of energy audits in 8 major regions of Kenya; creation of a network of energy auditors.	SME participation; sufficient number of capable professional to benefit from the training.
<b>Activity 1.2</b> Seminars and workshops	Good seminar/workshop attendance; presentation and open discussion of common energy use problems	Evaluation reports; Increased dialogue between SME and financial institutions.	Participation of SME staff and financial institution personnel
<b>Activity 1.3</b> Operation and maintenance skills	Awareness & use of control and monitoring equipment	Reports document improved energy performance	Qualified maintenance personnel
<b>Activity 1.4</b> Industrial energy efficiency network	Network established and active; industrial sub-sector energy use benchmarking;	Progress & evaluation report; results of energy audits reports widely disseminated	Increased dialogue and cooperation among SME and other stakeholders.



**Annex II – Logical Framework (continued)**

<b>Summary</b>	<b>Objectively Verifiable Indicators</b>	<b>Means of Verification</b>	<b>Critical Assumptions and Risks</b>
<b>Output 2 Financial barriers overcome</b>	Financial mechanisms adopted and operational	Progress & evaluation reports	Favourable GOK policy
<b>Activity 2.1</b> Guide for investors	Preparation of a comprehensive guide for investors; adoption of the Guide by public and private sector stakeholders;	Publication of the guide by the project; endorsement by GOK; Increased investor interest in energy efficiency projects	Active participation by SME, financial institutions and government ministries; Guide will provide reliable and useful information for project development; Guide updated regularly to include lessons learned from demo projects
<b>Activity 2.2</b> Course in financial engineering	Increased knowledge of fundamentals of life-cycle energy and economic analysis; 40 professionals trained; Business plans developed & acceptable to SME's & financing institutions; Preparation of bankable proposals; 20 proposals prepared; 12-15 proposals accepted & implemented.	Progress reports to show certifications by training institutes; Project evaluations; Progress reports showing projects being financed & implemented; New financial mechanisms developed and acceptable to SME.	Active participation of SME, local financial institutions, and other stakeholders; financing becomes applied to viable projects; energy efficiency projects widely replicated based on successes.
<b>Activity 2.3</b> Feasibility studies	14 feasibility studies completed in accordance with sound financial engineering principles.	Evaluation; studies completed in accordance with acceptable international standards; trained energy auditors participate.	Commitment by the SME; qualified staff to conduct technical, economic, financial and environmental analyses.

**Annex II – Logical Framework (continued)**

<b>Summary</b>	<b>Objectively Verifiable Indicators</b>	<b>Means of Verification</b>	<b>Critical Assumptions and Risks</b>
<b>Activity 2.4</b> Development of Financial Mechanisms and Project Financing	14 project documents prepared; energy efficiency project transaction costs are reduced by preparation of replicable financing schemes; financing secured.	Energy service agreements and investment agreements signed; models of novel financial mechanisms will be prepared and disseminated.	Favourable GOK policy and favourable investment terms through local financial institutions.
<b>Activity 2.5</b> ESCO development	Development of business plans for ESCOs; Favorable institutional framework developed for emergence of ESCOs; ESCO's established.	Progress reports & evaluations; ESCOs deliver viable energy efficiency projects acceptable to SME; ESCO business becomes profitable.	Favourable business climate and GOK policy; local energy and engineering companies become interested in energy service business; evolution of more entrepreneurial energy service companies.
<b>Output 3</b> <b>Demonstration projects</b>	Energy Efficiency Projects identified; 14 projects identified	14 demo projects selected	Commitment by the SME and financial institutions; GOK to enact appropriate legislation supporting energy efficiency
<b>Activity 3.1</b> Implementation of Demo Projects	SME are prepared to invest in profitable energy saving projects; Additional financing secured– loans repaid; 14 projects financed & successful through project;	Commissioning completed as shown in progress reports and evaluation; anticipated energy savings and GHG reductions are realized; financial benefits are realized.	SME's satisfied by project preparation will actually implement work; Demo project results and critical success factors documented; further energy saving benefits will be attained through replication in all SME sub-sectors.
<b>Activity 3.2</b> Measurement and Verification	Reports documenting energy savings produced and available; energy saving and GHG reductions of at least 20% achieved	Evaluation reports available; Measurement of savings according to the International Performance Measurement and Verification Protocol.	Confirmed energy savings and GHG emission reductions using internationally acceptable methods.

**Annex II – Logical Framework (continued)**

<b>Summary</b>	<b>Objectively Verifiable Indicators</b>	<b>Means of Verification</b>	<b>Critical Assumptions and Risks</b>
<b>Output 4 Institutional strengthening within the Project Management Unit</b>	Creation of a qualified PMU	Detailed workplan for project execution	Potential for harmonious and effective cooperation within PMU and with stakeholders
<b>Activity 4.1</b> Establishment of PMU	PMU staff engaged and PMU office established.	PMU recognized as a viable professional organization for project execution; Charter documents approved by Board of Directors.	Support of principal stakeholder Boards at KPLC and KAM; SME recognition and adoption of PMU to execute the project for the benefit of SME.
<b>Activity 4.2</b> Specialised short courses for PMU staff	Specialised training of PMU staff completed; six staff receive training; enhanced PMU capacity to train local energy professionals	Certification by national and international training institutes as shown in progress reports	Trained personnel to remain with the project; PMU to be a pivotal factor in the development of profitable and replicable energy saving projects.
<b>Activity 4.3</b> Study tours	Exposure and increased knowledge of international practices	Progress reports and evaluations show enhanced prep or efficiency projects	Trained personnel to remain with the project
<b>Activity 4.4</b> International conferences	Participation in international experience exchange	Presentation of technical papers; results discussed in international forums; international dissemination and peer review of results.	Technical merit of results
<b>Activity 4.5</b> Secondments	Exposure to/and increased knowledge of international best practices	Enhanced capacity to develop energy efficiency projects in accordance with international standards and practices	Trained personnel to remain with the project; increased confidence to develop sound energy efficiency investment projects.

The costs of project activities come to \$8.603 m, about \$3.513 m of which is attributable to the incremental costs of barrier removal. The remaining US\$5.090 m will be contributed by the SME owners themselves (US\$4.590m) and UNDP (US\$0.5m).

**Additional Benefits**

The project may have additional domestic benefits in terms of the new energy efficiency business opportunities which are opened up and a reduction in local air pollution associated with small and medium enterprise energy efficiency. Neither of these additional benefits have been included in the incremental cost calculations.

## **Annex III**

### **STAP Technical Review**

#### **1. Overall Impressions:**

This is a good proposal. The objectives of the proposal address significant barriers to energy efficiency and conservation in Kenyan small and medium scale industry. The activities are generally well thought out (with some caveats, see below). The writing is clear and generally well-argued.

#### **2. Relevance & Priority**

The objectives of the project are relevant to the goals of GEF. The project should be accorded a high priority.

#### **3. Background and Justification**

The project document provides adequate background and justification for the work.

#### **4. Scientific and Technical Soundness**

The basis for the project is the technical and scientific assumption that there is much energy to be cost-effectively saved in Kenyan industry. This is a valid and sound assumption.

There is another unstated (or muted) assumption: that these cost-effective efficiency improvements are not taking place primarily for lack of the factors that this project will strengthen: analysis, training, awareness, demonstration projects, publicity, and availability of incremental investments. This assumption (although likely to be at least partly true) remains untested, and is one of the necessary risks that the project must document and accept..

#### **5. Objectives**

The project objectives are valid and acceptable. The section on objectives and rationale is well written.

#### **6. Activities**

The project document proposes 4 activity components.

Component 1 will build capacity and create awareness about cost-effective energy efficiency measures in SME in Kenya.

In paragraph 15, the document states that “the SME managers tend to focus on reducing the cost of primary energy supply...”. The authors should make clear that this refers to the UNIT cost of primary energy supply. If the focus was on the TOTAL cost, then one would focus on reducing both the unit price and the quantity.

In paragraph 26, in the third line from the end of the paragraph, there should be a period (“.”) after the word efficiency, the word “and” should be deleted, and a new sentence should begin with the work

“One”.

This component is well argued.

Component 2 is addressing financial barriers.

In the last part of paragraph 29, the project document should address who will pay for keeping the guide updated. I’d suggest that a small explicitly provision of funds should be made for this important purpose.

Component 3 addresses demonstration projects.

Paragraph 44 states that “these demo projects will ... overcome financial barriers..”. However, the bulleted text in the paragraph refers to a number of non-financial issues. Suggest that you keep the bulleted issues, and clear up the preceding text.

The last bullet of paragraph 45 does not make sound business sense. Suggest you drop it.

Paragraph 46 describes the endowment fund that will cover the incremental burden costs of the energy efficiency projects. However, these are aimed to be recovered through the KAM-ESCO and returned to the fund so that the endowment funds gets replenished, and becomes a revolving fund. This needs careful thinking through. If the costs are recovered through the KAM-ESCO, then this is not really a grant to cover burden costs. The KAM-ESCO may sink under the burden of repaying the endowment fund payouts. Alternately, the KAM-ESCO may have to ask for a larger-than-competitive share of the avoided energy costs. This may make the whole operation unattractive, while competing ESCOs come up and outbid the KAM-ESCO by offering better terms

In paragraph 52, mention is made of monitoring the energy savings and env. impacts. Who pays for the monitoring? Some of these can be costly.

Component 4 addressed institutional strengthening and sustainability.

Paragraph 53 makes as an objective “building in ... environmental considerations in the SME business culture...” Business cultures don’t change easily, they evolve based on many complex factors. This goal is too ambitious and unlikely to succeed. Suggest that the project adopts a more modest goal on this topic.

Paragraph 57 mentions (in item 3) that the profitability will be determined on operating cost savings. But this is one-sided view. The profitability also depends on the amortized investment cost. Why will this be ignored?

Paragraph 59 reads like a set-up! In my opinion overstates what is likely to be accomplished, and provides a weak justification as to why it is likely to be accomplished.

## **7. Participatory Aspects**

KAM will probably participate with enthusiasm since it will host PMU. PSG may be able to attract participation from other SME members and associations.

## **8. Global Benefits**

Global environmental benefits are adequately identified, but should be quantified within a realistic range.

In the table included in paragraph 72, the third row, third column entry (“domestic benefits” under “alternative”) is brightly ambitious. Text should make clear that this is a GOAL, not a confirmed prediction of what will result from the project.

The global benefits calculated in the table of incremental costs matrix in Annex 1 has a serious error. The calculation in the matrix takes credit for all the CO<sub>2</sub> savings from the full (and optimistic) long term impact of the project and presents these CO<sub>2</sub> savings against the costs of the small GEF costs alone. However, this is not true. Even if the optimistic prediction of long term impact of the project comes true, the large savings in CO<sub>2</sub> of 70,000tons/year will be achieved by additional investments and costs that Kenya SME will undertake as a result of this work. Thus one can not take only the credit for the CO<sub>2</sub> savings in the long run, and ignore the investments to obtain those very saving in the long run.

## **9. GEF Strategies and Plans**

Project is consistent with GEF strategies and plan.

## **10. Replicability**

The project will be replicable if successful. However, see the second paragraph in section #12 below!

## **11. Capacity Building**

The project does aim at building capacity in Kenya.

## **12. Project Funding**

The proposed level of funding is appropriate for activities proposed.

In paragraph 73, section 3, there is a contradiction in terms when the author says “capital investment fund to cover incremental costs of economically viable projects”. Suggest again that this needs careful thinking through. Is this a capital fund or an endowment (=GRANTs) fund? Will the fund recover its payouts or not? If not, how will the overall activity continue beyond GEF funding? If it will recover the payouts, then how will it keep the funded SME projects from turning into economically non-viable ones, particularly because it is precisely claimed to cover the burden costs!!?

## **13. Time Frame**

Time frame for the project is adequate.

## **14. Secondary Issues**

Section 4 is about Risks and Sustainability. The whole section makes no admission of any risks!! The author needs to explicitly mention the risks and tell the reader how the project will guard against them.

In paragraph 63, the document states that there “will be” a continuing demand for ESCO’s commercial services after the project concludes. Some recognition of lack of full certainty would be a healthy note in the text. What happens if the “burden-covering” endowment fund is depleted and not yet replenished? What if the replenishment is so slow that the fund has fully paid out its amount and owing to lack of “burden-coverage” new projects don’t get started up?

The PSG (paragraph 67) will have only an advisory role, and its advice can be rejected or ignored. There is no control or incentive system to ensure that the PMU will be hard working, well directed, and results oriented.

## **15. Additional Comments**

See above



### Project Schedule

Component	Year 1	Year 2	Year 3	Year 4	Year 5
<b>1. Capacity Building and Awareness</b>					
Specialised training courses	x x	x x	x x	x x	x x
Regional energy auditing workshops	x x x	x	x	x	x x
Procurement of equipment	xxxxx				
Energy efficiency network development		xxxxxxx			
<b>2. Overcoming Financial Barriers</b>					
Guide for Investors	xxxxxxx				
ESCO development		xxxxx		xxxxx	
Financial engineering courses, including business plan development and bankable proposal preparation	xxx	xxx	xxx	xxx	
<b>3. Demonstration Projects</b>					
Implementation		xxxxxxxxx	xxxxxxxxx	xxxxxxxxx	xxxxxxxxx
Monitoring and evaluation		x x	x x	x x	x x
<b>4. Institutional Strengthening, Sustainability</b>					
Preparation of detailed workplan	xxx				
PMU Staff					
specialised short courses	x x	x x	x x	x x	
study tours	x	x	x		
international conferences	x x	x x	x x	x x	x x
secondments		xx	xx	xx	xx
energy use database	xxxxxxxxx	xxxxxxxxx			
Reporting (quarter, annual, final)	x x x x	x x x x	x x x x	x x x x	x x x x
Project Monitoring and Evaluation	x x	x x	x x	x x	x x