



## REQUEST FOR CEO ENDORSEMENT

**PROJECT TYPE: FULL-SIZED PROJECT**

**TYPE OF TRUST FUND: THE GEF TRUST FUND**

### PART I: PROJECT INFORMATION

<b>Project Title: Development of Cornerstone Public Policies and Institutional Capacities to accelerate Sustainable Energy for All (SE4All) Progress.</b>			
<b>Country:</b>	Lesotho	<b>GEF Project ID:</b>	5742
<b>GEF Agency:</b>	UNDP	<b>GEF Agency Project ID:</b>	5367
<b>Other Executing Partner(s):</b>	Ministry of Energy and Meteorology (MEM) – Department of Energy (DoE) - lead, Ministry of Development Planning (MDP), Bureau of Statistics (BoS), Lesotho Electricity and Water Authority (LEWA), Department of Standards and Quality Assurance (DSQA) of the Ministry of Trade and Industry, National University of Lesotho.	<b>Submission Date:</b>	28 April 2016
<b>GEF Focal Area(s)</b>	Climate Change	<b>Project Duration (Months)</b>	60
<b>Name of Parent Program (if applicable):</b>	n/a	<b>Project Agency Fee (\$):</b>	332,500

#### A. FOCAL AREA STRATEGY FRAMEWORK

<b>Focal Area Objectives</b>	<b>Expected FA Outcomes</b>	<b>Expected FA Outputs</b>	<b>Trust Fund</b>	<b>Grant Amount (\$)</b>	<b>Cofinancing (\$)</b>
CCM-3	Promote Investment in Renewable Energy Technologies.	Renewable energy capacity developed and equipment installed.	GEF TF	3,500,000	19,267,837
<b>Total Project Cost</b>				3,500,000	19,267,837

#### B. INDICATIVE PROJECT FRAMEWORK

<b>Project Objective:</b> To catalyse investments in renewable energy-based mini-grids and Energy Centres to reduce GHG emissions and contribute to the achievement of Lesotho's Vision 2020 and SE4All goals.						
<b>Project Components</b>	<b>Grant Type</b>	<b>Expected Outcomes</b>	<b>Expected Outputs</b>	<b>Trust Fund</b>	<b>Grant Amount (\$)<sup>1</sup></b>	<b>Confirmed Co-financing</b>
1. Development of cornerstone SE4All Policies and Strategies to facilitate investment	TA	SE4All cornerstone policies and strategies facilitating	1.1 Developed and approved SE4All Country Action Agenda (CAA), following extensive	GEF TF	400,000	854,692

<sup>1</sup> Exchange Rate: 1 \$ = 12 Maloti (LSL)

in renewable energy-based mini-grids.		(increased) investment in RET deployment, particularly isolated mini-grids.	<p>stakeholder consultations.</p> <p>1.2 Developed and approved SE4All Investment Prospectus (IP), following extensive stakeholder consultations.</p> <p>1.3 Strategies and investment plans related to mini-grid applications and village energisation schemes.</p>			
2. Baseline energy data collection and monitoring for SE4All.	TA	Improved capacity of energy stakeholders and government officials for decentralized clean energy planning and decision-making on the basis of quality energy data.	<p>2.1 National energy survey conducted on energy supply, consumption and demand, disaggregated by sector, district, village and application. The survey will disaggregate by gender and include energy access and intensity baseline data (energy efficiency) as well as penetration and performance of RETs.</p> <p>2.2 Energy database and information system established for data collected under Output 2.1 with clear responsibilities agreed to as regards regular monitoring and annual publication of indicators (between DoE and BoS).</p> <p>2.3 Energy modelling software in place to analyse the data, model scenarios and produce information that will promote RE policies.</p> <p>2.4 All energy-related data and plans in the</p>	GEF TF	300,000	1,307,193

			country harmonized with the new National Energy Policy and New Climate Change Strategy and in adherence with a standardized GHG emissions tracking system.			
3. Village-based energisation schemes.	TA/INV	Successful establishment of a village-based energy service delivery model for replication nationally.	<p>3.1 Completed pre-feasibility studies for mini-grids in 20 village communities spanning 5 of Lesotho's 10 districts (TA).</p> <p>3.2 Operational mini-grids in 10 village communities in the 5 districts (INV).</p> <p>3.3 Capitalisation of EU-supported Facility for Rural Electrification (FREA) and identification of 50 additional sites for mini-grids and 10 additional sites for Energy Centres for their post-project development under a phased approach.</p> <p>3.4 Capacity of national and district-level energy officials developed on best practices and opportunities for decentralized village energisation models in off-grid areas (TA).</p> <p>3.5 Financial Support Scheme established to support private sector investment in village-based energisation through mini-grids/Energy Centres.</p>	GEF TF	1,500,000 (TA) 1,000,000 (INV)	3,862,588 (TA) 12,200,000 (INV)
4. Outreach programme and dissemination of results.	TA	Outreach programme and dissemination of project	4.1 National Plan to implement outreach/promotional activities targeting	GEF TF	140,000	288,673

		experience/best practices/lessons learned for replication nationally and throughout the region.	both domestic and international investors. 4.2 Capacity development of concerned Ministries/Institutions to monitor and document project experience. 4.3 Published materials (including video) and informational meetings with stakeholders on project experience/best practices and lessons learned. 4.4 Lessons learned and results dissemination workshops.			
Subtotal					3,340,000	18,513,146
Project Management Cost				GEF TF	160,000	754,691
<b>Total Project Cost</b>					3,500,000	19,267,837

#### C. SOURCES OF CONFIRMED CO-FINANCING FOR THE PROJECT BY NAME (\$)

Please include letters confirming co-financing for the project with this form.

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount (\$)
National Government	Ministry of Energy and Meteorology (MEM) & associated energy agencies under its remit.	Cash	8,467,837
Multilateral donor	European Union	Cash	7,900,000
Private Sector	Bethel	Cash	2,000,000
Private Sector	Lesotho Solar Energy Society	In-Kind	500,000
GEF Agency	UNDP	Cash	400,000
<b>Total Co-financing</b>			19,267,837

#### D. Trust Fund Resources Requested by Agency, Focal Area and Country

GEF Agency	Type of Trust Fund	Focal Area	Country Name/Global	Grant Amount (\$) (a)	Agency Fee (\$) (b) <sup>2</sup>	Total (\$) c=a+b
UNDP	GEF TF	Climate Change	Lesotho	3,500,000	332,500	3,832,500
<b>Total Grant Resources</b>				3,500,000	332,500	3,832,500

**E. DOES THE PROJECT INCLUDE A “NON-GRANT” INSTRUMENT? No.**

**PART II: PROJECT JUSTIFICATION:**

**A: DESCRIBE ANY CHANGES IN ALIGNMENT WITH THE PROJECT DESIGN OF THE ORIGINAL PIF**

1. Component 1 in the PIF deals with baseline data collection while Component 2 addresses the development of cornerstone SE4All Policies and Strategies to facilitate investment in renewable energy-based mini-grids, with the latter also being the title of the project. During implementation of the PPG, it was indicated that addressing the macro issues related to policies and strategies for mini-grids would be the main driving force behind the project, in the absence of which it would be difficult to implement the other project components. Consequently, the sequence of Components 1 and 2 was reversed, with the result that Component 1 in the Request for CEO Endorsement (RCE) now deals with policies and strategies for mini-grids while Component 2 addresses baseline data collection and analysis. In any case, it was mentioned that activities under all project components will be implemented in parallel, to the extent possible.
2. The PIF envisaged undertaking pre-feasibility studies for mini-grids in 100 village communities spanning 5 of Lesotho's 10 districts and eventually setting up mini-grids in 60 village communities. However, during the Inception Workshop held in Maseru in February 2015, involving the participation of a wide range of stakeholders, discussions revolved around whether it would be practically feasible to establish 60 mini-grids by the end of the project, given that (i) there is absolutely no experience in the country with renewable energy-based mini-grids and (ii) the lengthy lead times required both putting in place a conducive policy to encourage the private sector to invest in mini-grids for the provision of electricity services (and thermal services, where appropriate) and actually having the villages energised. The stakeholders expressed the view that it would be technically and investment-wise more realistic to undertake pre-feasibility studies in 20 villages and target 10 of them for private sector-driven mini-grids, with the remaining 50 villages (out of the total of 60 to be energised) initially being serviced by 10 Energy Centres, with each being centrally located to serve 5 villages. In fact, the Government is already in the process of implementing such a pilot Energy Centre in the village of Lekokoaneng (Berea District) located some 34 km northeast of the capital, Maseru, with the support of the United Nations Economic Commission for Africa. The Lekokoaneng Multipurpose Clean Energy Centre (LeMCEC) will be operated by the local Central Farmers Association and will serve as a one-stop supplier/distributor for all energy efficient technologies and appliances for cooking, heating and lighting. In addition, it will introduce market-ready efficient technologies and provide capacity development and demonstration to the surrounding rural communities. The proposal to target only 10 villages for mini-grids and 10 Energy Centres was endorsed by the stakeholders.

Notwithstanding the above, the project will, in parallel with activities implemented during its 5-year duration, assist with the capitalisation of the EU's proposed Facility for Rural Electrification (FREA) and identify 50 additional sites for the construction of mini-grids and 10 additional sites for Energy Centres. In addition, it will secure the interest of the private sector to develop these sites post-project under a phased approach.

3. Again, in view of the long lead times that may be necessary to complete all activities under the project, the Workshop decided that the project duration should be extended to 5 years from the 4 years, as originally indicated in the PIF. This is designed to obviate the need for an extension, should the original time-frame of 4 years prove to be insufficient to successfully complete all project activities.
4. The PIF envisaged the formulation of “explicit sub-strategies and investment plans related to mini-grid applications and village energisation schemes” to promote private sector investment. Towards this end, the project proposes the establishment of a Financial Support Scheme with an initial budget of \$ 1.2 million that will be available to private sector investors to: (i) Serve as a Performance-Based Incentive (PBI) fund (a subsidy that is also referred to as OBA – Output Based Aid) that will be paid directly to them based on actual energy production of the renewable energy system installed; (b) Support the preparation of feasibility studies/business

plans (FS/BP) and partial investment for 10 isolated renewable energy-based mini-grids; and (c) Support the establishment of 10 Energy Centres, with each serving some 5 surrounding villages.

5. The PIF did not include an outcome related to outreach and dissemination of project experience/lessons learned for replication within country and throughout the region where similar opportunities exist. In fact, “information sharing and lessons learned” were included as an Output to Component 3 “Village-based energisation schemes” while Component 4 dealt with “Monitoring, Evaluation and Knowledge Management”. In order to streamline information sharing and lessons learned with monitoring, evaluation and knowledge management, Component 4 has been reformulated to encompass all of these elements into a new Component 4 entitled “Outreach programme and dissemination of project experience/best practices/lessons learned for replication nationally and throughout the region”. It is, of course, evident that monitoring and evaluation are necessary steps towards ascertaining “lessons learned” prior to their dissemination. This outcome is especially relevant as it will make information on best practices/lessons learned in Lesotho available to the neighbouring countries where opportunities may exist for similar activities to be implemented for the provision of modern energy services to rural communities.

## A.1 NATIONAL STRATEGIES AND PLANS:

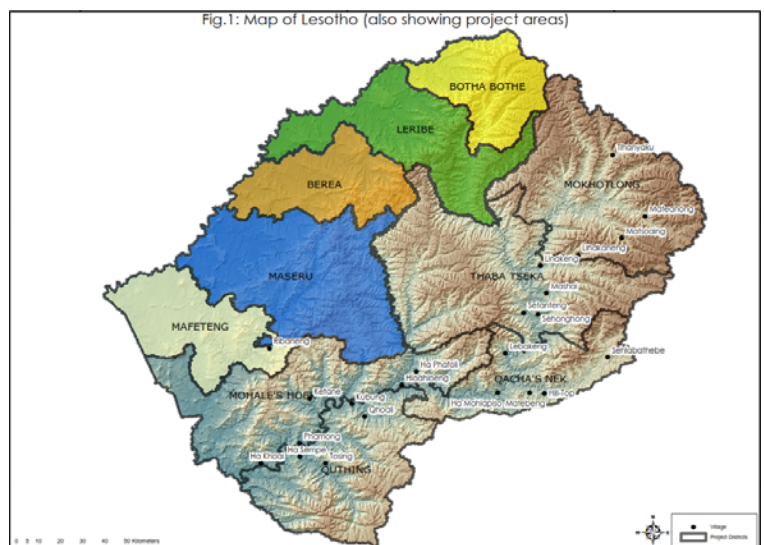
### 1. Situation Analysis

The Kingdom of Lesotho is a landlocked country, completely surrounded by South Africa, with an area of 30,355 square kilometres (approximately 11,720 square miles). The country has common borders with three of South Africa’s provinces, namely, the Free State in the west and north, the Eastern Cape in the south, and Kwazulu-Natal in the east (Fig. 1). The landscape is mountainous and rugged with elevations from 1,388 m to 3,482 m and extremely challenging for development – because of its topography, the country is often referred to as the “Mountain Kingdom”. Arable land is limited and less than 10% of the country is presently under cultivation. Lesotho is segregated into four (4) distinct agro-ecological zones/regions, namely, the Lowlands (17%), Foothills (15%), Mountains (59%) and Senqu (Orange) River Valley (9%).

**Fig. 1: Map of Lesotho**

These zones are characterized by significant climatic and ecological differences. The geomorphological and topographic conditions have largely confined favourable socio-economic conditions to the lowlands, the foothills and the Senqu River Valley, leaving the mostly barren and rugged mountain region mainly for grazing.

The climate of Lesotho is generally classified as temperate with alpine characteristics; the country experiences hot summers and relatively very cold winters by the African continent standards. Air temperatures tend to be lower than in other countries at similar latitudes mainly due to greater elevation above mean sea level. The main characteristics of the country’s climate are that it has four distinct seasons, huge fluctuations in temperature and erratic rainfall. Studies by the IPCC and Lesotho Meteorological Services suggest that probable climate change scenarios for Lesotho include increasing temperatures, changes in rainfall patterns, decreasing summer precipitation, and increasing intensity and frequency of extreme weather events.



For a more detailed description of the “Situation Analysis”, including “Stakeholder Analysis and Institutional Framework” and “National Strategies and Plans”, please refer to the UNDP Prodoc, pages 6 -16.

## **A.2 GEF FOCAL AREA AND/OR FUND(S) STRATEGIES, ELIGIBILITY CRITERIA AND PRIORITIES:**

The project is consistent with GEF-5, Climate Change Objective 3: "Promote Investment in Renewable Energy Technologies" aimed at reducing GHG emissions. It will promote the market for the utilisation of renewable energy sources to meet the needs of off-grid rural communities for energy services.

[For a detailed description, please refer to the UNDP Prodoc, Section 2 "Project rationale and policy conformity", pages 24 - 25 and "Country ownership: country eligibility and country drivenness", pages 28 – 29.](#)

## **A.3 THE GEF AGENCY'S COMPARATIVE ADVANTAGE:**

The proposed project is clearly within the comparative advantages of UNDP as stated in GEF Council Paper C.31.5 "Comparative Advantages of GEF Agencies".

[For a detailed description, please refer to "Section B.3: The GEF Agency's comparative advantage for implementing this project" of the PIF, page 34 -35.](#)

## **A.4 THE BASELINE PROJECT AND THE PROBLEM THAT IT SEEKS TO ADDRESS:**

The Government is cognisant of the fact that 76.3% of the country's population live in the rural areas and only 8.65 (DoE, 2014) of them have access to electricity services. To provide the un-electrified 94% of the rural population with electricity services through grid extension will simply be an insurmountable task in view of the very high costs associated with construction of electricity lines across a mountainous terrain to supply the small amounts of electricity that the rural population require. In addition, simply trying to do this would add to more electricity being imported from South Africa/Mozambique, unless massive investments are made in developing the country's abundance of hydropower resources, but, again, the cost of constructing transmission/distribution lines will be prohibitive. Consequently, there is a keen awareness among decision makers, as described above, of the need to shift towards more decentralised, sustainable and modern forms of energy for the much dispersed rural areas in terms of cooking, lighting and heating during the winter months.

Thus, renewable energy sources present an excellent alternative to grid extension. Renewable energy technologies can be utilised in isolated mini-grid configurations to provide the rural population with modern energy services, including electricity.

[For a detailed description of the baseline project and the problem that it seeks to address, please refer to the UNDP Prodoc, Section 1.4 "Baseline Situation and Problem to be addressed", pages 16 – 20 and Section 1.5 "Barriers to renewable energy-operated isolated mini-grids in Lesotho", pages 19 – 22.](#)

### **Renewable Energy-based isolated mini-grids: Lessons learned in other countries**

Experience to date in Lesotho with isolated grids relates only to those operating on micro/mini hydropower stations, except for the hybrid hydro-diesel-based isolated grid at Semonkong. An isolated diesel-based mini-grid operated for a few years in Sekake, some 45 km from Qacha's Nek, but the supply of diesel fuel combined with very expensive maintenance and repair resulted in the Government putting an end to diesel electricity generation there and connecting the town to the ESKOM grid at Ha Mpitli.

[For a more detailed description of the "Lessons learned in other countries", please refer to UNDP Prodoc Section 1.6, pages 22 – 23.](#)

### **Financial Support to project developers**

Investment in renewable energy projects often requires to be supported with financial incentives, at least initially, because such projects are not only typically more investment-intensive in terms of upfront costs, but they are also, in some cases, considered to be riskier investments due to technology or resource uncertainties. The degree to which cost and risk factors apply varies according to technology and geographical location and project developers expect some form of financial support/risk-sharing to compensate them for taking on additional financial risks due to, as in the case of Lesotho, the absence of a working business model that can be emulated. There needs to be a policy and



regulatory framework developed for private sector participation in energy service delivery for off-grid services. Such a mechanism would open the way for sustainable project development financing for rural electrification and a sustainable operating subsidy mechanism for off-grid services that draws on the current cross-subsidy already established for on-grid services.

[For a more detailed description of “Financial support to project developers”, please refer to UNDP Prodoc Section 1.6, pages 25 – 28.](#)

## **Project Components**

The Ministry of Energy and Meteorology (MEM) is the central body, through the Department of Energy (DoE), responsible for formulating and implementing the Government’s policy in the field of energy, including on-grid electrification through grid extension and off-grid electrification through isolated mini-grids. It is also entrusted with the responsibility of putting in place policy, plans and programmes that govern the promotion and utilisation of renewable energy for isolated mini-grids. The Regulatory Authority (LEWA) is also under the same Ministry and manages the Universal Access Fund that is dedicated to rural electrification. MEM’s Department of Energy will be entrusted with implementation of the present project and, in doing so, it will work very closely with other Government Agencies, the private sector and NGOs to ensure that the participation of a full range of stakeholders is secured and effective.

Past off-grid renewable energy-based rural electrification efforts in Lesotho were overly focused on procurement and delivery of systems rather than a service delivery model with private sector partners. In addition, there is currently no major effort to disseminate more efficient thermal energy devices (e.g. cook stoves) on any significant scale in rural and peri-urban areas. For the country to achieve its Vision 2020 objectives and mobilize additional investments under SE4All, it needs to develop a replicable, market-based and vertically-integrated model for village-based clean energy provision and this is proposed to be set in motion with renewable energy-based mini-grids together with the establishment of Energy Centres where consumers will also have access to non-electrical modernised energy sources and appliances like LPG, improved cook stoves, portable LED lights, etc. In addition, the Government has demonstrated strong commitment to SE4All targets and its intention to continue to provide basic energy services to rural communities and promote the use of renewable energy technologies is evidenced in the 2014/2015 National Budget where more than 50% of the \$ 7.7 million (Maloti 84.9 million) available to the electricity sector is earmarked to implement its Rural Electrification Programme.

[For a more detailed description of “Project Components”, please refer to UNDP Prodoc Section “Project objective, outcomes and outputs/activities”, pages 30 – 40.](#)

## **A.5 INCREMENTAL/ADDITIONAL COST REASONING**

GEF intervention is needed to remove the policy, regulatory, technical, market and other barriers which hamper realisation of the Government plans to harness the abundant sources of renewable energy to provide the 76% of the country’s total population who live in the rural areas with modern energy services. This is expected to create a conducive environment for the private sector to invest in electricity generation from renewable energy sources to establish rural mini-grids and set up Energy Centres to serve the rural consumers by providing them with efficient choices for meeting their other (non-electrical) energy needs.

By completion of the 5-year project period, slightly over 235 tonnes of CO<sub>2</sub> would have been avoided as a direct result of renewable energy-based electricity generation. Furthermore, 185 tonnes of CO<sub>2</sub>/year would continue to be avoided annually over the remaining almost 18 years of useful life of the equipment. Thus, the total direct emission reduction, without replication, over a 20-year projected equipment life will be 3,565 tCO<sub>2</sub> (235 tonnes + 18 years x 185 tonnes/year). In addition, over a post-project period of 10 years, it is estimated that another 213,680 tonnes of CO<sub>2</sub> would be directly avoided as a result of replication under the EU-supported Facility for Rural Electrification, which will be capitalised during the project lifetime.

[For a detailed description of the Incremental/Additional cost reasoning, please refer to the UNDP Prodoc Section 1.4 on “Barriers to renewable energy-operated isolated mini-grids in Lesotho”, pages 18 - 21 and Section on “GHG Calculations”, pages 43 - 46.](#)



**A.6 RISKS** (including climate change, potential social and environmental risks that might prevent the project objectives from being achieved and measures that address these risks).

<b>Risks</b>	<b>Rating</b>	<b>Impact/Mitigation Approach</b>
Policy: Framework to encourage the private sector to invest in renewable energy-based rural energy services.	High	There exists the possibility that the Government may not act soon enough on a policy framework that will encourage the private sector to invest in renewable energy-based rural energy services; as examples, the 2003 Energy Policy and the 2013 Renewable Energy Policy have been in draft form for quite some time. If this were to happen, project implementation will get hampered. However, the Government is strongly motivated to provide access to modernised energy services to the large rural population that utilises traditional forms of energy, to improve their quality of life and for income-generating activities, and is driven by its plans to meet both the objectives of the Lesotho Vision 2020 and the S4All Initiative. Towards this end, it only very recently approved the new 2015 Energy Policy, thus sending the right signal to stakeholders. With regard to the 2013 Renewable Energy Policy, it is still in draft form. However, the donor community will work with the newly-installed Government to have the right policy in place and preliminary indications are that this may materialise sooner, rather than later. Moreover, project interventions under Component 1 will assist in mitigating this risk.
Institutional: Dependence on SAPP imports could increase or become more attractive relative to development of the country's indigenous RETs.	Moderate	The risk of continued dependence on electricity imports from the South African Power Pool, mainly based on coal generation, will remain in border areas, to the detriment of renewable energy based decentralised options. However, this does not pose a risk deep inside the country, as stringing long electricity lines does not make economic sense due to the small loads and difficult terrain. Moreover, this risk will be mitigated by the fact that, as per existing projections (ref. Southern African Power Pool: Planning and Prospects for Renewable Energy, IRENA 2013) which indicate that "the share of renewable technologies in electricity production in the South African Power Pool region could increase from the current level of 10% to as high as 46% in 2030".
Financial: SE4All funding resources may not materialize, thus making the CAA and IP of little use.	Moderate	If this were to happen, it will provide a set-back in the development of RETs in the country, as the project does not have leverage over the high-level global commitments and funding mechanisms established as part of SE4All. However, indications from the country action process developed by the SE4All Secretariat are that those countries that expeditiously complete their CAA and IP documents will be prioritized as regards access to dedicated SE4All funds when and if they materialize. Project interventions under Component 4 will assist in mitigating this risk by targeting both domestic and international investors.
Poor investment climate.	Moderate	The fact that Lesotho ranks in the 128 <sup>th</sup> place in "Ease of doing Business", as per the WB/IFC "Doing Business 2015" publication and 115 <sup>th</sup> in enforcing contracts might act as a deterrent for investors in RETs, although these have not tempered investors' willingness to invest in the garment industry to benefit from business opportunities available under AGOA. With this in mind, the project will put in place a Financial Support Scheme that will be directed at minimising the financial risks that lenders and investors may face in doing business targeting RETs for the rural areas.
Technology: Renewable energy equipment of	Moderate	Poor quality of equipment and shoddy installation have been shown to have plagued some SHS in Lesotho. Hence, the Government will put in place, through the Department of Standards and Quality Assurance (DSQA), strict controls on the standards of renewable energy equipment that can be imported and installed

poor quality introduced in the country.		in the country. In addition, the Government will ensure that all installations and maintenance should be undertaken only by licensed and certified technicians as per established electricity codes.
Environmental/ Climate Change.	Moderate	There are multiple environmental risks, as outlined in Lesotho's Second National Communication to UNFCCC (e.g. reduced rainfall that can affect water flows, land and watershed degradation due to erosion and population pressures) that can affect energy planning and infrastructure investments. These are being and will continue to be addressed through capacity development of Government staff on the key aspects to address national challenges associated with weather, climate and climate change.

## A.7 COORDINATION WITH OTHER RELEVANT GEF-FINANCED INITIATIVES

- Reducing vulnerability from climate change in the Foothills, Lowlands and the Lower Senqu River Basin: This LDCF-financed project (GEF funding: \$ 8.4 million; Project duration: 6 years) will contribute towards strengthening institutional and technical capacities of government institutions to plan for and implement adaptation using an ecosystem management approach. In particular, the project will: i) develop a geo-based climatic, agro-ecological and hydrological information system to inform the analysis of climate-driven vulnerabilities and the cost-effective planning of climate-smart ecosystem rehabilitation and management measures; ii) strengthen institutional capacity for land use planning and decision-making by integrating climate risks into development plans and policies; iii) provide access to knowledge and training on adaptation using an ecosystem management approach; and iv) demonstrate climate-smart ecosystem rehabilitation and management measures in the Foothills, Southern Lowlands and the Lower Senqu River Basin. Project activities are scheduled to start shortly.

For a detailed description under this Section, please refer to UNDP Prodoc Section “Coordination with other relevant GEF-financed initiatives”, pages 47 – 49.

## B. ADDITIONAL INFORMATION NOT ADDRESSED AT PIF STAGE:

### B.1 Describe how the stakeholders will be engaged in project implementation.

The project will be implemented through the NIM execution modality by the Ministry of Energy and Meteorology. The Ministry will appoint a National Project Director who will assume overall responsibility for project implementation, ensure the delivery of project outputs and the judicious use of project resources. The National Project Director will be assisted by a Project Management Unit headed by a Project Manager (PM) to be recruited through a competitive process. The PM will be responsible for overall project coordination and implementation, consolidation of work plans and project papers, preparation of quarterly progress reports, reporting to the project supervisory bodies, and supervising the work of the project experts and other project staff. The PM will also closely coordinate project activities with relevant Government and other institutions and hold regular consultations with project stakeholders. An international part-time Chief Technical Adviser (18 weeks/year) will be recruited to support the PM on technical issues, while a full-time Project Assistant (PA) will support the PM on administrative and financial matters.

For additional information on “Stakeholder Participation”, please refer to UNDP Prodoc, Section “Management Arrangements”, pages 58 – 62.

### B.2 Describe the socio-economic benefits to be delivered by the Project at the national and local levels, including consideration of gender dimensions, and how these will support the achievement of global benefits.

The project will bring about benefits at both local and national/global levels through reduced environmental and human health threats due to less burning of diesel, kerosene (paraffin) and wood/twigs, thus reducing negative environmental impacts. Some of the benefits in the long term are listed below:

- Electricity from the mini-grids will provide opportunities for households, mainly women, to pursue income-generating activities requiring an electricity service and extend the hours of school children for homework. In addition, the availability of improved cook stoves at Energy Centres will reduce, if purchased, the time the households and their children daily spend in collecting twigs/dung for cooking.
- Provision of electricity (a clean and smokeless fuel), instead of candles and kerosene, for lighting will assist in eliminating respiratory/eye problems associated with exposure to smoke and reducing all too frequent accidental house fires.
- A rural development dynamism through support to rural households who will be encouraged to utilise electricity from the mini-grids for income-generating activities like ice-making, juice-vending, powering sewing machines, mobile phone charging, internet cafés, video clubs, etc. **This is expected to generate 900 jobs during the project and immediate post-project period.**
- Opportunities for the private sector in job creation for renewable energy-based isolated mini-grid installation, operation and maintenance, and operation/management of Energy Centres. The project will work with local training institutions (e.g. National University of Lesotho, Lerotholi Polytechnic, Bethel Business and Community Development Centre, University of Lesotho, etc.) to develop the technical capacity required by project developers.
- The project will seek to achieve gender equality through the empowerment of women to fully participate in all project activities and specifically those related to capacity development under the various project components.
- Participation of civil society, through the involvement of NGOs, including women's NGOs, and stakeholder consultations, in the decision-making process related to renewable energy-based isolated mini-grids and for information and awareness raising activities.
- **225 jobs (total of 1,125 jobs, including the 900 jobs indicated in bullet point above) will be created in the installation, operation and maintenance of mini-grids, and operation/management of Energy Centres. In addition, 3,000 households will benefit from clean, modern energy services.**

### **B.3 Explain how cost-effectiveness is reflected in the project design.**

The Government is cognisant of the fact that it is an unsurmountable task to serve the un-electrified 91.35% of the country's rural population through grid extension because of the high costs associated with the construction of electricity distribution lines in a mountainous terrain. In addition, simply trying to do this at the present time would add to more electricity being imported from South Africa (through coal generation)/Mozambique, unless massive investments are made in developing the country's abundance of hydropower resources. Even then, the cost of stringing the lines through difficult terrain to every single village will be prohibitive. Consequently, there is a keen awareness among decision makers of the need to shift towards more decentralised, sustainable and modern forms of renewable energy-based systems for the much dispersed rural areas in terms of cooking, lighting and heating during the winter months.

The recent experience with solar home systems (SHS) in the country under the LREBRE project did not give much hope to the Government to pursue that route for decentralised electricity services. As pointed out during the PPG inception workshop, "SHS are not the solution for Lesotho; the objective should be to sell a service, not a technology". As stringing of lines to the bulk of the unelectrified rural population will be extremely expensive, the other options would be to use imported diesel or locally-available renewable energy sources (biomass, hydro solar and wind, where available), to power isolated mini-grids. However, in the case of diesel, delivery of fuel will pose a problem due to the mountainous terrain, as evidenced in the case of the installed 5x50 kVA diesel generator sets in Ketane that never went into operation due to the difficult terrain for diesel fuel transportation, the very high cost in fuel delivery (approx. \$ 140/barrel) and the absence of locally available capacity to operate and maintain it. Hence, the only viable alternative is for the Government to implement the renewable energy option through mini-grids and to promote the use of modern energy appliances/technologies at multiple Energy Centres in the various districts.

With regard to electricity generation costs in the country, LHDA generates electricity from hydropower at 1.1 US Cents/kWh, while the purchase price from South Africa is 7.2 US Cents/kWh and 12 US Cents/kWh from Mozambique, including wheeling charges. Regarding diesel generation cost in the country, the Semonkong case shows that its generation at this isolated hybrid hydro/diesel power station is 62 US Cents/kWh. Electricity generation costs from PV for mini-grids are not available in Lesotho; however, as a reference, the average feed-in-

tariff is 30 - 35 US Cents/kWh in Kenya, Tanzania and Uganda for PV mini-grids, indicating that it would be around that range in the country as well.

As indicated in Section A.5 above, the direct project and immediate post-project emissions reduction will amount to 213,680 tonnes of CO<sub>2</sub> avoided (3,565 tCO<sub>2</sub> + 210,115 tCO<sub>2</sub>), which translates into an abatement cost of \$ 16 of GEF funds per tCO<sub>2</sub> reduced. On an annual basis, as part of the PIR reporting process, the project will examine the costs of mini-grids compared to household-level solar powered systems and products, with a view to determining whether the latter may be more cost-effective in terms of expanding energy access to more people in a shorter period of time.

### C. DESCRIBE THE BUDGETED M & E PLAN:

The Monitoring and Evaluation (M&E) Work Plan and Estimated Associated Budget are presented in the Table below:

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project team staff time</i>	Time frame
Inception Workshop and Report	<ul style="list-style-type: none"> <li>Project Manager</li> <li>UNDP CO, UNDP GEF</li> </ul>	Indicative cost: 12,000	Within first two months of project start up.
Measurement of Means of Verification of project results.	<ul style="list-style-type: none"> <li>UNDP GEF RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members.</li> </ul>	To be finalized in Inception Phase and Workshop.	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on output and implementation.	<ul style="list-style-type: none"> <li>Oversight by Project Manager</li> <li>Project team</li> </ul>	To be determined as part of the Annual Work Plan's preparation.	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	<ul style="list-style-type: none"> <li>Project manager and team</li> <li>UNDP CO</li> <li>UNDP RTA</li> <li>UNDP EEG</li> </ul>	None	Annually
Periodic status/ progress reports.	<ul style="list-style-type: none"> <li>Project manager and team</li> </ul>	None	Quarterly
Mid-term Review	<ul style="list-style-type: none"> <li>Project manager and team</li> <li>UNDP CO</li> <li>UNDP RSC</li> <li>External Consultants (i.e. evaluation team)</li> </ul>	Indicative cost: 35,000	At the mid-point of project implementation.
Terminal Evaluation	<ul style="list-style-type: none"> <li>Project manager and team.</li> <li>UNDP CO</li> <li>UNDP RSC</li> <li>External Consultants (i.e. evaluation team).</li> </ul>	Indicative cost: 40,000	At least three months before the end of project implementation.
Audit	<ul style="list-style-type: none"> <li>UNDP CO</li> <li>Project manager and team</li> </ul>	Indicative cost per year: 3,000 (Total: 15,000)	Yearly
Visits to field sites	<ul style="list-style-type: none"> <li>UNDP CO</li> <li>UNDP RSC (as appropriate)</li> <li>Government representatives</li> </ul>	For GEF supported projects, paid from IA fees and operational budget.	Yearly


Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project team staff time</i>	Time frame
<b>TOTAL indicative COST</b>  Excluding project team staff time and UNDP staff and travel expenses.		US\$ 102,000	

### **PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT AND GEF AGENCY**

#### **A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT ON BEHALF OF THE GOVERNMENT**

NAME	POSITION	MINISTRY	DATE (mm/dd/yyyy)
Stanley Damane	Director of Environment, GEF OFP	Ministry of Environment and Tourism	02/18/2014

#### **B. GEF AGENCY (IES) CERTIFICATION**

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for CEO Endorsement.					
Agency Coordinator, Agency name	Signature	Date (Month, day, year)	Project Contact Person	Telephone	Email Address
Adriana Dinu UNDP-GEF Executive Coordinator		April 28, 2016	Faris Khader, Regional Technical Advisor, EITT	+251 91 250 3307	<a href="mailto:faris.khader@undp.org">faris.khader@undp.org</a>

## ANNEX A: PROJECT RESULTS FRAMEWORK

An abridged version of the logframe is provided below. However, a complete version can be found in the GEF-UNDP project document.

Objective/ Outcome	Indicator	End of Project Targets	Sources of information
<b>Objective</b> - To catalyse investments in renewable energy-based mini-grids and Energy Centres to reduce GHG emissions and contribute to the achievement of Lesotho's Vision 2020 and SE4All goals.	Emission reductions (in tCO <sub>2</sub> over 20 yr timeline) Energy produced (MWh) by RETs. Number of jobs created. Number of beneficiary households in rural areas.	RET-based electricity generation of 211 MWh/year. Total reduction of 213,680 tonnes of CO <sub>2</sub> (project and immediate post-project) over the 20-year lifetime of the RET systems. Estimated cumulative indirect GHG emission reduction of 641,040 tonnes of CO <sub>2</sub> by 2025 applying a replication factor of 3. 1,125 jobs created. 3,000 beneficiary households in rural areas.	Project's annual reports, GHG monitoring and verification reports. Project mid-term review and terminal evaluation reports.
<b>Outcome 1</b> – SE4All cornerstone policies and strategies facilitating (increased) investment in RET deployment, particularly isolated mini-grids.	Existence of policies and strategies.	To be completed and approved by Government within 12 months of project initiation.	Project documentation.
<b>Outcome 2</b> – Improved capacity of energy stakeholders and government officials for decentralized clean energy planning and decision-making on the basis of quality energy data.	Capacity of stakeholders developed.	To be completed within 12 months of project initiation.	Project reports.
<b>Outcome 3</b> - Successful establishment of a village-based energy service delivery model for replication nationally.	Availability of business model.	To be completed within 18 months of project start.	Project documentation.
<b>Outcome 4</b> Outreach programme and dissemination of project experience/best practices/lessons learned for replication nationally and throughout the region.	Existence of outreach programme.	Increased awareness among stakeholders in place to promote and develop RET-based mini-grids for village energy services.	Project final report and web site.



**ANNEX B: RESPONSES TO PROJECT REVIEWS** (from GEF Secretariat and GEF Agencies, and Responses to Comments from Council at work program inclusion and the Convention Secretariat and STAP at PIF)

**RESPONSE TO GEFSEC COMMENTS AT CEO ENDORSEMENT**

**Response to GEFSec Comments dated April 18, 2016**

Secretariat Comment	UNDP Response	Reference
<p><b>7. Are the components, outcomes and outputs in the project framework (Table B) clear, sound and appropriately detailed?</b></p> <p>The comparison with grid extension is not warranted. We strongly urge the project team to examine during the project implementation period the costs of mini-grids compared to home based solar powered systems and appliances. These may be more cost-effective for giving more people energy access in a short period of time. We urge on an annual basis to evaluate if the goal for mini-grids should be maintained or supplanted by more cost-effective means to achieve energy access. Please ensure the proposed energy centres can support this cost-effective approach.</p>	<p>UNDP takes note of the GEF Secretariat comment to annually evaluate, during project implementation, the cost-effectiveness of mini-grids compared to other ways of providing the same level of service. The project will also ensure that Energy Centres provide rural inhabitants with options that support cost-effectiveness in the provision of energy services. The following text has been added to the section on Cost Effectiveness: “On an annual basis, as part of the PIR reporting process, the project will examine the costs of mini-grids compared to household-level solar powered systems and products, with a view to determining whether the latter may be more cost-effective in terms of expanding energy access to more people in a shorter period of time.”</p>	<p>CER: Page 12, Prodoc: Pages 46, 48, 60</p>
<p><b>16. Is the GEF funding and co-financing as indicated in Table B appropriate and adequate to achieve the expected outcomes and outputs?</b></p> <p>The co-financing figure is not fully justified.</p> <p>a) The proposed co-financing of \$30 million from the EU is supported by a letter dated 4 May 2015. This is almost one year ago. Please confirm that status of the proposed EU funding for the 11<sup>th</sup> EDF and also confirm how much of the proposed \$30 million will be available for Lesotho.</p> <p>b) As noted in the re-designed project, the EU funding may be</p>	<p>a) The attached email of 21 April 2016 from the EU Delegation in Lesotho confirms that the total amount of \$30 million is allocated to Lesotho’s energy sector under the 11<sup>th</sup> European Development Fund (EDF). This funding allocation will be utilised for the following two phases: Phase 1 “will put more emphasis on reinforcement of the policy environment and the institutional framework, complemented with selected pilot projects”. Phase 2 “will support larger scale energy investments, along with further support to the sector reform, where required.”</p> <p>b) Phase 1 of the EU funding is expected to coincide with the implementation period of the SE4ALL project and</p>	<p>Please see the attached e-mails from the EU Delegation in Lesotho</p>

Secretariat Comment	UNDP Response	Reference
used for the post-project financing under the facility. As such, it should not count as cofinancing for the project. Please adjust the EU co-financing amount to an estimated amount that will contribute during the project period, and only for the amount available in Lesotho.	will support the objectives of the GEF project, which also addresses the policy environment and includes pilot projects. The EU has further confirmed, in its email of 25 April 2016, that the Phase 1 funding amounts to €7 million (\$ 7.9 million). Accordingly, we have revised the co-financing tables/amounts in the CEO Endorsement Request, project document and tracking tool, and the revised versions of these are attached.	
<b>17. At CEO endorsement: Has co-financing been confirmed?</b>  See box 16.	This comment has now been addressed, as per the preceding response and the e-mail confirmation from the EU Delegation in Lesotho.	
<b>26. Is CEO endorsement/approval being recommended?</b>  Most comments cleared, with the exception of boxes 8, 16 and 17.	All technical comments have now been addressed. We look forward to receiving the CEO endorsement.	

#### Response to GEFSec Comments dated February 12, 2016

Secretariat Comment	UNDP Response	Reference
<b>6. Is (are) the baseline project(s), including problem(s) that the baseline project(s) seek/s to address, sufficiently described and based on sound data and assumptions?</b>  The baseline problem of lack of energy access is described. However, the proposed solution, mini-grids, is not sufficiently described as how it will help meet the problems and barriers to energy access.	On the basis of the findings of the terminal evaluation of the GEF-funded Lesotho Renewable Energy-based Rural Electrification project, which came to a close in 2013, “the Government decided that it would in future pursue a private sector-driven model of isolated renewable energy-based mini-grids for the provision of electricity services to the rural areas, where the grid operators will be responsible for proper operation and maintenance of installed equipment. It was pointed out during the PPG inception workshop that “SHS are not the solution for Lesotho; the objective should be to sell a service, not a technology. This will put the rural population at par (albeit with “skinny grids”) with those residing in the urban areas in that they need not purchase their electricity generating systems; instead, they get connected to an isolated mini-grid and pay for the services they receive on a regular basis”. These mini or “skinny” grids can provide energy access at a fraction of the cost of grid extension and “can unlock affordable initial interventions -- like lighting, mobile phone charging, fans, and TVs plus a small amount of agro processing -- to help people get onto the energy ladder today rather than forcing them to wait decades for a grid extension that may never come” (ref. Sierra Club, 2014)”. Thus, the project directly responds to the government’s priorities and will reduce barriers to energy access in areas where grid extension is unlikely in the near to medium term.	Bottom of page 17 and top of page 18 of Prodoc.
<b>7. Are the components, outcomes and outputs in the project framework (Table B) clear,</b>	1) No new component has been introduced to deal with Outreach; we have just rearranged/regrouped certain activities to present them in a logical manner. In	Bottom of page 4 of PIF and bottom of Page 5/top of page

Secretariat Comment	UNDP Response	Reference
<p><b>sound and appropriately detailed?</b></p> <p>Some of the project components have been re-arranged and prioritized during the project design phase. Changes were clearly described. Please address the following comments:</p> <p>1) The new component on outreach requests funding that is over 5% of the total GEF amount. Therefore, the agency will need to document this as a major amendment and the project will be submitted to Council prior to CEO endorsement. Please prepare the major amendment letter.</p> <p>2) component 3 proposes to help conduct pre-feasibility studies for 20 mini-grids leading to investment in 10 mini-grid projects. This is more than a 5x reduction in results, even though the reported co financing has increased significantly. Please justify why the lower target is valid and include that justification in the major amendment letter.</p>	<p>addition, the budget allocation indicated in the PIF for this Component has not changed. The PIF, as approved by GEF, earmarked \$ 140,000 for Monitoring and Evaluation (M&amp;E) and knowledge management. Under para. 5 of the CEO ER “Describe any changes in alignment ....” It is indicated that “The PIF did not include an outcome related to outreach and dissemination of project experience/lessons learned for replication within country and throughout the region where similar opportunities exist. In fact, “information sharing and lessons learned” were included as an Output of Component 3 “Village-based energisation schemes” while Component 4 dealt with “Monitoring, Evaluation and Knowledge Management”. In order to streamline information sharing and lessons learned with monitoring, evaluation and knowledge management, Component 4 has been reformulated to encompass all of these elements into a new Component 4 entitled “Outreach programme and dissemination of project experience/best practices/lessons learned for replication nationally and throughout the region”. It is, of course, evident that monitoring and evaluation are necessary steps towards ascertaining “lessons learned” prior to their dissemination. This outcome is especially relevant as it will make information on best practices/lessons learned in Lesotho available to the neighbouring countries where opportunities may exist for similar activities to be implemented for the provision of modern energy services to rural communities. Additionally, the budget has been maintained at \$ 140,000.</p> <p>2) Two rounds of extensive consultations were held in Maseru during the PPG stage with all concerned stakeholders, ranging from government agencies, NGOs and the private sector. There was broad consensus by all participants on both the scope of the project and the expected targets. The justification behind a reduction of the number of pre-feasibility studies is provided in the CEO ER, namely “The PIF envisaged undertaking pre-feasibility studies for mini-grids in 100 village communities spanning 5 of Lesotho’s 10 districts and eventually setting up mini-grids in 60 village communities. However, during the Inception Workshop held in Maseru in February 2015, involving the participation of a wide range of stakeholders, discussions revolved around whether it would be practically feasible to establish 60 mini-grids by the end of the project, given that (i) there is absolutely no experience in the country with renewable energy-based mini-grids and (ii) the lengthy lead times required both putting in place a conducive policy to encourage the private sector to invest in mini-grids for the provision of electricity services (and thermal services, where appropriate) and actually having the villages energised. The stakeholders</p>	<p>6 of CEO ER.</p> <p>Para. 2, page 5 of CEO ER.</p> <p>CEO ER, page 3; Prodoc, page 33</p>

Secretariat Comment	UNDP Response	Reference
	<p>expressed the view that it would be technically and investment-wise more realistic to undertake pre-feasibility studies in 20 villages and target 10 of them for private sector-driven mini-grids, with the remaining 50 villages (out of the total of 60 to be energised) initially being serviced by 10 Energy Centres, with each being centrally located to serve 5 villages. During implementation, the project will capitalise the Facility for Rural Electrification (FREA) and identify private sector investors ready to develop mini-grids in 50 villages. We have added the following output to reflect this: “Output 3.3 Capitalisation of EU-supported Facility for Rural Electrification (FREA) and identification of 50 additional sites for mini-grids and 10 additional sites for Energy Centres for their post-project development under a phased approach.”</p> <p>The Government is already in the process of implementing such a pilot Energy Centre in the village of Lekokoaneng (Berea District) located some 34 km northeast of the capital, Maseru, with the support of the United Nations Economic Commission for Africa. The Lekokoaneng Multipurpose Clean Energy Centre (LeMCEC) will be operated by the local Central Farmers Association and will serve as a one-stop supplier/distributor for all energy efficient technologies and appliances for cooking, heating and lighting. In addition, it will introduce market-ready efficient technologies and provide capacity development and demonstration to the surrounding rural communities. The approach to mini-grids has not changed; it is deemed the most appropriate one for the country. The project will still target 60 mini-grids (in addition to a total of 20 Energy Centres), as outlined in the PIF. However, the project will adopt a phased approach by implementing 10 mini-grids during the project duration while also assisting with the capitalisation of FREA and identifying an additional 50 sites for mini-grids, together with securing the interest of the private sector to develop them immediately post-project. Since the phased approach will result in a similar level of ambition as the PIF, we believe that a major amendment is not required.</p> <p>With regard to the increase in co-financing, it is related to the EU’s endorsement of the project and its willingness to allocate funds under its 11<sup>th</sup> European Development Fund (2014-2020) under which “it is quite likely that the EU may propose the establishment of a Facility for Rural Electrification (FREA) and, should this happen, the present project will, no doubt, act as a precursor to this initiative”. The EU indicated at the Inception Workshop that it was looking for a suitable model for renewable energy-based rural electrification and should the proposed project develop such model, the EU will come in at full speed to ensure scaling-up far surpassing what was foreseen in the PIF. Hence, 60</p>	

Secretariat Comment	UNDP Response	Reference
<p>3) The estimated GHG benefits have been reduced significantly from the PIF stage. Please justify and include that justification in the major amendment letter.</p> <p>4) Given the significantly reduced results of the revised proposal and significantly reduced GHG benefits, please justify if the agency considered taking an alternative approach to achieve renewable energy scaling that would be more cost effective than mini-grids.</p>	<p>mini-grids and 20 Energy Centres will still be developed during the project/immediate post-project period. .</p> <p>3) Under the proposed phased approach, direct project/immediate post-project GHG impacts (20-year equipment projected life) will be 213,680 tCO<sub>2</sub>, while the indirect post-project (bottom-up) emission reduction over the next 10 years of project influence will be 641,040 tCO<sub>2</sub>. Furthermore, the mini-grid business model that will be developed is expected to be adopted by the private sector and scaling-up will get catalysed with EU support. Thus, as indicated under (2) above, no major amendment is required.</p> <p>4) Mini-grids would be the most effective way (please see information of cost implications of grid extension in response to GEF Comment 11 below) to provide electricity services to the 76% of the rural population living in the rural areas where grid extension is prohibitively expensive. This is recognised by all stakeholders and is proposed for implementation both in The Lesotho Energy Policy 2015 and Vision 2020. In addition, focus on only Energy Centres (EC) would worsen the issue of GHG benefits, as their contribution would be on an average 250 tCO<sub>2</sub>/year/EC, whereas renewable energy-based mini-grids would on an average abate 3,700 tCO<sub>2</sub>/year/mini-grid.</p>	<p>CEO ER, pages 9, 12, and 14; Prodoc, pages 2, 40, 45-46, and 50</p>
<p><b>8) (a) Are global environmental/adaptation benefits identified? (b) Is the description of the incremental/additional reasoning sound and appropriate?</b></p> <p>The description of the GHG benefits is included on page 8 of the CEO endorsement request and aligned with the tracking tool. However, the cost effectiveness calculations on page 11 appears to be calculated including indirect benefits. Please re-calculate based on direct benefits and justify the very high cost for such few emissions benefits.</p>	<p>As indicated in the CEO ER and Prodoc, a total of 213,680 tonnes of CO<sub>2</sub> will be abated during the project/immediate post-project period, resulting in a direct abatement cost \$ 16/tonne of CO<sub>2</sub>.</p>	<p>CEO ER, pages 9, 12, and 14; Prodoc, pages 2, 40, 45-46, and 50</p>
<p><b>11. Does the project take into account potential major risks, including the consequences of climate change, and describe sufficient risk mitigation measures? (e.g., measures to enhance climate resilience)</b></p>	<p>There are, no doubt, risks associated with this project, just like in any other project, and these are spelled out in Table 5 in the Prodoc. However, the benefits by far outweigh the risks when the following is taken into account: "The Government is cognisant of the fact that 76.3% of the country's population live in the rural areas and only 8.65% (DoE, 2014) of them have access to electricity services. To provide the un-electrified 91.35%</p>	<p>Pages 40-41 of Prodoc.</p> <p>Pages 16 and 9 of Prodoc.</p>

Secretariat Comment	UNDP Response	Reference
<p>Some risks are described, however, it is clear that mini-grids may be a "bridge to far" for this project. Please comment on whether the risks outweigh the benefits and the project should be redesigned.</p>	<p>of the rural population with electricity services through grid extension will simply be an insurmountable task in view of the very high costs associated with construction of electricity lines across a mountainous terrain to supply the small amounts of electricity that the rural population require (e.g. between \$ 20,000 to \$ 30,000/km; for comparison purposes, these costs run from \$ 13,000 to \$ 19,000/km of line in Kenya, Senegal or Mali). In addition, simply trying to do this would add to more electricity being imported from South Africa/Mozambique, unless massive investments are made in developing the country's abundance of hydropower resources, but, again, the cost of constructing transmission/distribution lines will be prohibitive. In addition, the project will generate many local development benefits including a healthier environment for rural communities, opportunities for income-generating activities, at least 1,125 new jobs, and improved natural resource management.</p>	
<p><b>12. Is the project consistent and properly coordinated with other related initiatives in the country or in the region?</b></p> <p>We would like to see more references to successful energy access activities in other parts of Africa that can be used as models.</p>	<p>Arguably, one of the most successful energy access initiatives in Africa is the M-KOPA Solar model in East Africa. In less than 2.5 years since launch, M-KOPA has installed over 150,000 residential solar systems in Kenya, Uganda and Tanzania, and is now connecting over 500 new homes each day, on a commercial basis. M-KOPA sells SHS using mobile phone technology with payment (lease to own) done via M-PESA (online banking). The company is now franchising to Uganda and Tanzania (ref. "Solar micro-grids take roots in East Africa", Renewable Energy World, 24 March 2016). They are not yet interested in out-sourcing their technology to other countries, focusing on their core markets in East Africa for the time being. For this model to work, a supportive market environment is required (such as they have in Kenya – no subsidies) and a robust online mobile banking system whereby SIMs are embedded in the systems and all payments and collections are done via mobile banking. Perhaps in a few years' time if mobile phone banking penetration is higher and the government promotes a market-based approach it could work in Lesotho – in Kenya they have the largest concentration of people in the world using mobile banking, even the very poor have M-PESA. That is the key to it working – mobile banking – and the government keeping a level playing field.</p> <p>There is tremendous potential for mini-grids in Africa. It is estimated that up to 120 million people, about 20 percent of the population in unelectrified regions in Africa, could be connected to mini-grids. There is considerable interest on the part of many African governments, including Lesotho, to put in place suitable regulations and to create a conducive enabling environment for private sector investment. It is expected</p>	<p>Bottom of page 18 of Prodoc.</p> <p>Bottom of page 45 of Prodoc.</p> <p>Pages 46-48 of Prodoc.</p>



Secretariat Comment	UNDP Response	Reference
	that this GEF-funded SE4ALL project will help to lower the key barriers hampering the development of mini-grids in Lesotho, thereby contributing to a more favourable investment environment.	
<p><b>13. Comment on the project's innovative aspects, sustainability, and potential for scaling up.</b></p> <ul style="list-style-type: none"> <li>• Assess whether the project is innovative and if so, how, and if not, why not.</li> <li>• Assess the project's strategy for sustainability, and the likelihood of achieving this based on GEF and Agency experience.</li> <li>• Assess the potential for scaling up the project's intervention.</li> </ul> <p>As currently written, the project has changed from the innovative approach identified in the PIF. The PPG phase may have produced data that shows the project needs to be re-focused away from expensive mini-grids.</p>	<p>The project has not changed its approach or direction from the one outlined in the PIF; only the scope within the project timeframe has changed. Mini-grids are still the focus and 60 villages will be targeted, with a phased approach, as described above, of initially servicing some villages through Energy Centres until they get mini-grids of their own. This is a first-of-its-kind project in Lesotho where the private sector will manage and operate RE based mini-grids.</p>	
<p><b>14. Is the project structure/design sufficiently close to what was presented at PIF, with clear justifications for changes?</b></p> <p>No. The changes to the project constitute a major amendment; many of the changes in response to stakeholder input indicate that consideration of a whole-sale redesign may be warranted. If mini-grids are so expensive and difficult, it may be wiser to pursue a broader energy access agenda focused on lower-costs solar PV powered products, such as lights, chargers, and appliances. Alternatively, the project could be redesigned to focus only on cook-stoves. Both approaches would require a significant re-design but may prove more effective. Please compare other UNDP projects that worked on energy access to</p>	<p>The proposed project has not departed from the PIF nor has proposed structural changes. However, implementation of the PPG did show that that the pace of implementation outlined in the PIF, within the specific context of Lesotho, was overly optimistic, as discussed under UNDP Response to comment 7 (2) above. The project has, therefore, attempted to propose a pace of implementation with which all stakeholders are comfortable and that will still deliver the desired and anticipated results, but within a somewhat longer timeframe, under the phased approach, than originally envisaged in the PIF.</p> <p>The Prodoc still deals with mini-grids with the added dimension of Energy Centres. This approach is in line with Goal # 1 of The Lesotho Energy Policy 2015, namely "Contributing towards the improvement of livelihoods: The energy sector will contribute towards poverty alleviation in Lesotho. This will be achieved through the creation of income generating opportunities that sustain and improve the lives of people in the country through facilitating the provision of affordable technologies and services". In addition, this approach is in line with the objectives of Vision 2020, "... to develop a replicable, market-based and vertically-integrated</p>	<p>Page 14 of Prodoc.</p> <p>Page 29 of Prodoc.</p> <p>Pages 31 and 48 of Prodoc.</p>

Secretariat Comment	UNDP Response	Reference
identify lessons learned that can be applied in this project.	model for village-based clean energy provision and this is proposed to be set in motion with renewable energy-based mini-grids together with the establishment of Energy Centres where consumers will also have access to non-electrical modernised energy sources and appliances like LPG, improved cook stoves, portable LED lights, etc.” Thus, the 10 Energy Centres that will be set up under the project (and the 10 additional ones to be established post-project) and that will serve 50 communities will be promoting precisely the type of products suggested such as solar lanterns and chargers. Moreover, other on-going initiatives already target cook stoves (e.g. TED and SREP) and pre-wired PV systems (SREP) and these will also be promoted at the Energy Centres.	
<p><b>15. Has the cost-effectiveness of the project been sufficiently demonstrated, including the cost-effectiveness of the project design as compared to alternative approaches to achieve similar benefits?</b></p> <p>No. Please see comments in boxes 7 and 8. The revised project has a very low cost effectiveness that may dictate a refocusing of efforts on other renewable energy technologies.</p>	The project scope (not its approach) has been scaled back (to ensure its successful implementation) not because of its cost-effectiveness, but because it will bring a novel approach to Lesotho where the private sector will manage and operate RE based mini-grids. The first few mini-grids are always the most difficult establish. Once the model has been demonstrated and experience has been gained, subsequent mini-grid installations will be easier. Hence, the rationale behind the proposed phased approach for implementation.	
<p><b>16. Is the GEF funding and co-financing as indicated in Table B appropriate and adequate to achieve the expected outcomes and outputs?</b></p> <p>The co-financing appears to be very high, yet the results appear to be very small. Please explain how more than \$30 million in co-financing can result in only 10 mini grid installations.</p>	The high co-financing is due to the \$ 30,000,000 EU contribution under EDF-11. It is indicated in the Prodoc that “Discussions with the Government are presently on-going to define the exact nature of activities that will be targeted under EDF-11. In this connection, it is quite likely that the EU may propose the establishment of a Facility for Rural Electrification (FREA) and, should this happen, the present project will, no doubt, act as a precursor to this initiative”. As indicated under 7.2 above, the EU would be willing to scale-up a successful model for mini-grids based on renewable energy. Under the new Output 3.3, it is expected that the FREA will be capitalised during the project lifetime, with support from the EU.	CEO ER, page 3; Prodoc, page 33
<p><b>17. At CEO endorsement: Has co-financing been confirmed?</b></p> <p>See box 16.</p>		
<p><b>23. Has the Agency adequately responded to comments from:</b></p> <ul style="list-style-type: none"> <li>• STAP?</li> <li>• Convention Secretariat?</li> <li>• The Council?</li> </ul>		

Secretariat Comment	UNDP Response	Reference
The agency responded directly to Germany's three comments and the US two comments directly. However, due to the major amendments, the comments will need to be revisited after circulation of a CEO endorsement package to Council.		
<b>26. Is CEO endorsement/approval being recommended?</b>  No. Due to the major revisions to the project, it no longer appears cost-effective. We encourage a thoughtful consideration of whole-sale redesign. Please see comments in boxes: 6,7,8,11,12,13,14,15,16,17. Also, we do not see responses to GEFSEC comments in box 25 of the PIF review.	All technical comments have now been addressed. We look forward to receiving the CEO endorsement.	

#### RESPONSES TO GEFSEC COMMENTS AT PIF STAGE

Secretariat Comment	UNDP Response	Reference
<b>25. Items to consider at CEO endorsement/approval</b>  Please address the following at CEO endorsement: a) Component 1. Please further explicate the types of TA and INV for this component. There may be types of INV that GEF funding cannot support.  b) Component 2. Please coordinate with other SE4All countries undertaking similar efforts	a) Under Component 1 of the PIF, an energy database information system and energy modelling software were erroneously labelled as INV instead of TA. In fact, these relate to building the capacity of the Department of Energy for decentralized clean energy planning and decision-making on the basis of reliable energy data and, therefore, clearly fall under TA activities. Accordingly, this was rectified in the CEO ER where only Component 3 "Village-based energisation schemes" has both INV and TA.  b) The Prodoc indicates that "The formulation of the CAA (Country Action Agenda) will need to be in line with the "Guidelines for Developing National SE4All Action Agendas in Africa" (mandated by the November 2012 African Union Conference of Energy Ministers) and follow the "SE4All Country Action Agenda Template". In implementing this activity, support will be sought under the "SE4All Africa Hub" based at AfDB Headquarters. In addition, consultations will be held with neighbouring countries	Page 2 of CEO ER.  Bottom of page 30 and top of page 31 of Prodoc.  Pages 24 -28 of Prodoc.

Secretariat Comment	UNDP Response	Reference
	also formulating their CAAs in order to establish synergies and commonality of approach during the process.	
c) Component 3. The emphasis on business model and supply chain is valuable. At CEO endorsement we look forward to more detail on the types of financial mechanisms. Consider coordinating with solar energy access schemes being developed under the BNEF FIRE initiative.	c) Under the heading “Financial Support to Project Developers”, the Prodoc elaborates on the setting up of a Financial Support Scheme to (i) To establish a performance-based incentive (PBI) fund; (ii) To support the preparation of feasibility studies/business plans (FS/BP) and partial investment for isolated renewable energy-based mini-grids; and (iii) To support the establishment of 10 Energy Centres, with each serving some 5 surrounding villages. The suggestion to coordinate with the BNEF FIRE initiative is noted, especially within the context of the very recently announced “Almost 100 million households worldwide may be powered by solar panels by 2020, according to Bloomberg New Energy Finance”. This will be undertaken during project implementation.	Page 2 of CEO ER
	d) Table B of the CEO ER does indicate TA and INV separately for each project component, where appropriate, including the co-financing amount.	
	e) The amount of co-financing (equity and debt) to be brought to the table by each potential individual investor will only be known during project implementation. However, the competitive bidding process will determine which investor requires the lowest/smallest “subsidy” from the Financial Support Scheme.	Page 8 of CEO ER.
d) Please indicate TA and INV on separate rows in Table B with appropriate co-financing indicated.	f) As indicated in the CEO ER and Prodoc, a total of 213,680 tonnes of CO <sub>2</sub> will be abated during the project/immediate post-project period, resulting in a direct abatement cost \$ 16/tonne of CO <sub>2</sub> . In addition, indirect post-project (bottom-up) emission reductions over the next 10 years of project influence will result in an abatement of 641,040 tonnes of CO <sub>2</sub> .	
e) As the providers will be selected competitively, it will be possible to estimate the amount of co-financing that will be provided by each successful bidder. If the amount is a requirement for the RFP and competitive process, these estimated amounts can be counted as confirmed co-financing at CEO endorsement stage.		
f) Please revise and update the emissions		

Secretariat Comment	UNDP Response	Reference
benefits based on the lifetime of the investments and add estimated indirect benefits.		

## RESPONSES TO COUNCIL RECOMMENDATIONS

Comment	Response	Reference
<p><b>Germany's Comments</b></p> <p>Germany approves the following PIFs in the work program, but asks that the following comments are taken into account:</p> <p>Suggestions for improvement to be made during the drafting of the final project proposal:</p> <p>The proposal is well thought through and it elaborates in detail the situation and problem. Barriers and risks are well examined and key lessons from previous energy access programs are taken into consideration and are integrated in the project proposal; current baseline activities are also well documented with regard to their gaps and required improvements in the alternative project scenario. Given the large number of government bodies, other institutions and facilities engaged in the project, the main challenge will be to clearly define the specific roles and responsibilities of the different stakeholders during the PPG phase.</p> <p>Germany asks the following:</p> <ol style="list-style-type: none"> <li>1. It needs to be ensured that all relevant stakeholders understand their roles. An effective coordination and collaboration is key to the success of this project. Germany welcomes that all relevant stakeholders are invited to participate in the design of the project during PPG phase.</li> <li>2. To avoid duplication of activities, the full analysis of how the project can be harmonized and integrated with LEAP activities needs careful attention during PPG phase.</li> <li>3. Germany supports the comments by STAP, especially with regard to including the water,</li> </ol>	<ol style="list-style-type: none"> <li>1. One-to-one discussions were held with a large number of stakeholders during implementation of the PPG and these were followed up at both the Inception and Validation Workshops held in Maseru at the start and towards the end of the drafting process.</li> <li>2. There was no follow-up after formulation of the LEAP programme document, with the result that no resources were mobilised/allocated for its implementation. However, many of the activities proposed in LEAP (e.g. number of villages for pre-feasibility studies, village energisation through mini-grids, etc.) were subsumed in the PIF submitted to GEF – the subject of the present project.</li> <li>3. The project will work hand-in-hand with the Bureau of Statistics for data collection and data</li> </ol>	

<p>energy and land/agriculture nexus into the data collection efforts.</p> <p>4. Direct and indirect benefits of the project to be provided at CEO Endorsement should not be limited to GHG emission reductions, but should also include co-benefits.</p>	<p>analysis software to be procured. Capacity development to be provided in their utilisation will be tailored so that the database can be adapted to contain information not only on energy, but also on a wide range of issues such as agriculture, land, water, etc.</p> <p>4. In addition to GHG benefits, the other co-benefits include the number of beneficiary households that will have access to modern energy services and the 375 jobs to be created in both RETs and in empowering interested households/women through income-generating activities utilising the availability of energy. Moreover, the usage of improved, smokeless cook stoves available for purchase at Energy Centres will reduce respiratory and eye problems associated with exposure of women (and small children by their side in the kitchen) to smoke.</p>	
<p><b>USA's Comments</b></p> <p>The United States is supportive of Lesotho's efforts to support policies and catalyse investments in sustainable energy projects in rural areas. To increase project impact, we request that the following technical comments be considered in the final project proposal prior to GEF CEO Endorsement:</p> <p>1. The proposal notes that lack of high level policies pertaining to energy and private sector engagement have been an obstacle in supporting investments in sustainable energy in Lesotho. To help address some of the barriers, we suggest that the UNDP develop a robust plan for coordinating among donors to ensure energy focused initiatives are supportive of off-grid technologies and to encourage an enabling environment required to allow relevant government ministries to support increased investment in sustainable energy initiatives.</p> <p>2. The proposal identifies a lack of feasible business models as a primary difficulty for accelerating investment in renewable energy. The focus on establishing quality standards and the idea of using mobile banking as a means of facilitating payments cost-effectively are good and have been keys to success in other countries. To develop standards and a framework for establishing mobile banking in Lesotho, it is likely that there will be a need for significant technical assistance for government employees, but also on the project developer side. We suggest that, as this project moves forward, that attention be paid to training those on the</p>	<p>1. The project will focus specifically on those policy issues that present themselves as barriers to private sector participation in off-grid modern energy services. The bigger picture related to Lesotho's Energy Policy in its totality is the subject of support from the European Union. In this connection, during implementation of the PPG, discussions were held with the donor community present in Lesotho to brief them about the project and to ensure coordination/avoid duplication of efforts once project activities start.</p> <p>2. Quality of equipment and installation standards for Solar Home Systems installed under the UNDP-GEF LREBRE project proved to be the weak links in electricity services delivery to the rural areas not connected to the grid, as evidenced in the project terminal evaluation report. Hence, the present project will work with the Government's Department of Standards and Quality Assurance (DSQA) to ensure that only RET's meeting the country's (or adopted international) standards can be imported into the country and installation standards are strictly observed. This will protect both the private sector and consumers from purchasing sub-standard equipment/appliances that break down</p>	



ground to get projects up to “bankable standards”.	soon after installation.  Mobile banking is already being utilised in Lesotho for recharging prepaid electricity meters through Vodacom Lesotho and Econet Telecom Lesotho. This system will be expanded for payment of electricity services provided by the isolated mini-grids.	
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## RESPONSES TO STAP RECOMMENDATIONS

Comment	Response	Reference
<p>1. STAP welcomes this well presented proposal.</p> <p>2. The aim of the project is to support policies and also catalyse investment in sustainable energy projects in rural areas. Energy access is essential for economic growth and using renewable energy systems to achieve this without increasing greenhouse gas (GHG) emissions is commendable. Providing data from the energy survey will provide a baseline but it will no doubt be challenging to achieve useful levels of accuracy. It is not clear who will undertake the energy survey and who will be interviewed. If it can be achieved, the database will be valuable when developing strategies for SE4All. The majority of the funding sought is for establishing rural energy demonstration systems in 60 villages.</p> <p>3. The criteria to be used to obtain the short list of 100 villages and then to narrow this down to the 60 final ones seems appropriate. Having a geographic spread throughout the country is key to ensure replication takes place. Given Lesotho's varied terrain as well as the country's high vulnerability to climate change, severe land degradation programs and reliance on fuelwood for rural energy use, it might make sense to incorporate a spatial analysis into the baseline energy data collection that incorporates land cover and land use that can be used to pinpoint areas of high or low suitability for future proposed renewable energy (RE) interventions, particularly wind, small hydro and bioenergy. Current climate models predict declining crop yields due to loss of arable lands, water shortages and higher evaporation rates due to increased temperatures. (Saha, T.K., 2011.</p>	<p>2. Once the energy survey has been designed and approved by DoE/BoS, students from the University/post-secondary Technical Institutions will be recruited and trained to undertake the survey under the supervision of the relevant authorities. Spot checks will be undertaken to ensure accuracy of the data being collected.</p> <p>3. The identification of 100 villages for pre-feasibility studies and selection of 60 of them for energisation, spanning 5 Districts, were first articulated in the LEAP document. When LEAP did not materialise, this idea was incorporated in the PIF. However, as indicated on page 4 of the present RCE, the Inception Workshop participants expressed the view that it would be technically and investment-wise more realistic to undertake pre-feasibility studies in 20 villages and target 10 of them for private sector-driven mini-grids, with the remaining 50 villages (out of the total of 60 to be energised) initially being serviced by 10 Energy Centres, with each being centrally located to serve 5 or more villages.</p> <p>The energy, water, land and agriculture nexus is an important one that needs to be considered in its totality in order to provide a comprehensive picture on the interrelation among them. Data collection and analysis under the project is limited to the energy</p>	

<p>Impact of climate change on agricultural production in Lesotho: A case study. African Crop Science Conference Proceedings (10): 273 - 277). Clearly, the water, energy, land/agriculture nexus is important and there is an opportunity to incorporate all of these features into any future data collection effort, particularly if the goal is to eventually identify sites for RE systems.</p> <p>4. There is considerable experience of developing mini-electricity grids in many countries and this could be useful to examine. But the design of each differs with the renewable energy resources available and the demand profile. This will need careful attention for each proposed village system. Tools are already available such as HOMER or RETSCREEN models used for assessing optimum systems of renewables. It seems small and micro-hydro and solar have the greatest resource potentials, though given the high susceptibility of Lesotho to the impacts of climate change, the latter may incur less overall risk. Wind and bioenergy power should also not be ignored.</p> <p>5. The models can be used to undertake cost assessments in order to optimise the systems. The main problem will be to determine the load capacity and profile of a community, and the peak load to be met by the system. Linking with energy efficient electric appliances such as LED lighting is critical. The other issue is to anticipate how to build in the need for increasing generation capacity in the future as demand for more appliances increases along with economic growth.</p> <p>6. The barriers and risks are well documented, the main one being to develop human capacity to ensure that maintenance and servicing can maximise the operating life of the energy systems. It is good this is being addressed.</p> <p>7. The present projects outlined have been useful to establish the baseline. The aim should be to ensure this GEF project builds on these studies where feasible and as outlined in Table 1.</p> <p>8. The assessment of the GHG emission avoidance appears to be robust given the uncertainties of land use and avoided deforestation.</p>	<p>component and during implementation of this component, the project will work closely with the Bureau of Statistics (BoS). Hence, this collaboration will present opportunities for the project to support the BoS in integrating the energy data collected in its comprehensive national natural resource database. This, in turn, will assist the Government in having a complete picture of the country's natural resource base prior to making decisions on future sites/villages for renewable energy systems.</p> <p>4. During implementation, the project proposes to invite the private sector from neighbouring countries where renewable energy-based mini-grids have been successfully established to share their experience and to explore the possibility of setting up joint business ventures with the local private sector.</p> <p>Capacity development will be provided to DoE/private sector in the use of such software for mini-grid system design.</p> <p>Prior to implementing village energisation, a feasibility study/business plan will be prepared that takes into consideration the best renewable source option for that particular village and, in addition, to solar, biomass, micro-hydro and wind will be considered where applicable.</p> <p>5. Once a specific village is selected, a survey will be undertaken to determine consumer requirements in terms of energy services and the system to be installed will be sized accordingly. Allocation will be made for future system capacity expansion related to demand growth by existing consumers and addition of new consumers. In addition to energising the villages, the use of efficient electric appliances and LEDs will be promoted. In fact, the proposed Energy Centres that will benefit from support under the project will be barred from selling incandescent bulbs, for example.</p>	
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## ANNEX C: STATUS OF IMPLEMENTATION OF PROJECT PREPARATION ACTIVITIES AND THE USE OF FUNDS

### A. EXPLAIN IF THE PPG OBJECTIVE HAS BEEN ACHIEVED THROUGH THE PPG ACTIVITIES UNDERTAKEN.

The PPG objective of formulating detailed Project Document has been achieved. The project formulation was done through consultations involving a range of stakeholders. Consultative activities were taken up through individual interviews with stakeholders and workshop (Problem/solution analysis and Log frame Workshop).

### B. DESCRIBE FINDINGS THAT MIGHT AFFECT THE PROJECT DESIGN OR ANY CONCERNS ON PROJECT IMPLEMENTATION, IF ANY:

N/A

### C. PROVIDE DETAILED FUNDING AMOUNT OF THE PPG ACTIVITIES AND THEIR IMPLEMENTATION STATUS IN THE TABLE BELOW:

The activities achieved during PPG are shown in the table below:

<i>Project Preparation Activities</i>	<i>GEF Amount (\$)</i>		
	<i>Amount Approved</i>	<i>Amount Spent to date</i>	<i>Amount Committed</i>
Inception workshop	8,000	8,000	0
Technical review and baseline analysis	50,000	42,000	8,000
Define institutional arrangements and monitoring and evaluation framework	18,000	12,500	5,500
Financial planning and co-financing investments	16,000	10,905	5,095
Validation workshop	8,000	8,000	0
	<b>100,000</b>	<b>81,405</b>	<b>18,595</b>

\*Any uncommitted amounts should be returned to the GEF Trust Fund. This is not a physical transfer of money, but achieved through reporting and netting out from disbursement request to Trustee. Please indicate expected date of refund transaction to Trustee. N/A