



**PROJECT IDENTIFICATION FORM (PIF) <sup>1</sup>**  
**PROJECT TYPE: Full-sized Project**  
**TYPE OF TRUST FUND: GEF Trust Fund**

**PART I: PROJECT IDENTIFICATION**

Project Title:	Energy Efficient Production and Utilization of Charcoal through Innovative Technologies and Private Sector Involvement		
Country(ies):	Sierra Leone	GEF Project ID: <sup>2</sup>	4840
GEF Agency(ies):	UNDP	GEF Agency Project ID:	4904
Other Executing Partner(s):	Ministry of Energy and Water Resources; Environment Protection Agency - Sierra Leone (EPA-SL)	Submission Date: Resubmission Date: Resubmission Date: Resubmission date:	07 March 2012 05 April 2012 13 April 2012 03 August 2012
GEF Focal Area (s):	Climate Change	Project Duration (Months)	48
Name of parent program (if applicable): ➤ For SFM/REDD+ <input type="checkbox"/>		Agency Fee (\$):	176,818

**A. FOCAL AREA STRATEGY FRAMEWORK<sup>3</sup>:**

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Indicative Financing (GEF) (\$)	Indicative Co-financing (\$)
CCM-2: Promote market transformation for energy efficiency in industry and the building sector	Outcome 2.2: Sustainable financing and delivery mechanisms established and operational	Output 2.2: Investment mobilized Output 2.3: Energy savings achieved	1,650,000	8,800,000
Project management cost <sup>4</sup>			118,182	200,000
<b>Total project costs</b>			<b>1,768,182</b>	<b>9,000,000</b>

**B. PROJECT FRAMEWORK**

Project Objective: Improved and more efficient use of biomass energy resources						
Project Component	Grant Type	Expected Outcomes	Expected Outputs	Trust Fund	Indicative Grant Amount (\$)	Indicative co-financing (\$)
1. Policy and regulatory frameworks on the use of more efficiently produced charcoal and improved cook	TA	Strengthened institutional capacity on biomass resource utilization at the national, regional and community level	1.1 Adequately trained and capable decision-makers and relevant stakeholders (from EPA-SL, ministries, private sector, rural communities, etc.) leading efforts, communicating and managing more efficiently produced charcoal and improved	GEFTF	375,000	1,600,000

<sup>1</sup> It is very important to consult the PIF preparation guidelines when completing this template.

<sup>2</sup> Project ID number will be assigned by GEFSEC.

<sup>3</sup> Refer to the reference attached on the Focal Area Results Framework when filling up the table in item A.

<sup>4</sup> GEF will finance management cost that is solely linked to GEF financing of the project.

stoves		Operational effective policy, legal, and regulatory frameworks and review mechanisms on biomass energy technology applications	<p>1.2 Formulated, approved and enforced policies, laws and regulations on more efficient charcoal production and utilization</p> <p>1.3 Formulated, approved and implemented incentive schemes for more efficiently produced charcoal and improved cookstove technology applications</p> <p>1.4 Formulated, approved, controlled and enforced policies, laws and regulations for the use of more efficient kilns and ICSs</p> <p>1.5 Reviewed lessons learnt in the financing and scaling up of more efficiently produced charcoal, and ICS production</p> <p>1.6 Developed standards and certification for more efficiently produced charcoal and improved cookstove</p>			
2. Development of public-private initiatives for the improved and more efficient production of charcoal and the scaling up of improved cookstove production	Inv	Increased number of investments on improved, more efficient charcoal and ICS production in Sierra Leone	<p>2.1 Established partnerships between the public and private stakeholders involved in the value chain of charcoal production and utilization</p> <p>2.2 Developed incentives, more efficiently produced through carbon finance and microfinance to scale up more efficient charcoal and ICS production and commercialization</p> <p>2.3 Three (3) tested prototypes of improved cook stoves that are promoted for commercial production and widespread application</p> <p>2.4 Designed and implemented large scale program for the financing of 1,000 energy efficient charcoal kilns and 15,000 improved cook stoves</p> <p>2.5 Developed inclusive supply and value chains for improved charcoal production and ICS use</p> <p>2.6 Adequately capable local entrepreneurs producing certified charcoal and certified improved cook stoves</p> <p>2.7 Established and operational framework for the phase-out of traditional cook stoves</p>	GEFTF	1,050,000	5,400,000

3. Improved, more efficient production and efficient utilization of certified charcoal and cookstove	TA	The production and utilization of certified charcoal and certified improved cook stoves are common practices in Sierra Leone  Enhanced capacity of stakeholder in the value chain (producers, farmers, villagers, women, consumers, collectors)	3.1 Developed gender sensitive capacity development and modules for the production and utilization of certified charcoal and ICS  3.2 Developed and implemented promotional schemes on the social, economic and environmental co-benefits of improved charcoal and improved cook stoves to generate good buy-in and willingness to pay  3.3 Sensitized key value chain actors through public awareness campaign and capacity development	GEFTF	225,000	1,800,000
Project management Cost <sup>5</sup>					118,182	200,000
<b>Total project costs</b>					<b>1,768,182</b>	<b>9,000,000</b>

### C. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, (\$)

Sources of Cofinancing for baseline project	Name of Co-financier	Type of Cofinancing	Amount (\$)
National Government	Government of Sierra Leone	In kind	500,000
GEF Agency	UNDP (core budget and PREP programme)	Cash/in kind	3,000,000
Bilateral Aid Agency (ies)	European Commission	Cash	3,000,000
Private Sector	Several private companies	Cash/in kind	2,500,000
<b>Total Cofinancing</b>			<b>9,000,000</b>

### D. GEF/LDCF/SCCF RESOURCES REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY<sup>1</sup> : N/A.

## PART II: PROJECT JUSTIFICATION

### A. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

#### A.1.1 THE GEF FOCAL AREA STRATEGIES:

This project is consistent with the GEF-5 strategy to address climate change, especially the Objective 2 (*Promote market transformation for energy efficiency in industry and the building sector*), as improved cookstove use and efficient charcoal production will lead to energy saving.

#### A.2. NATIONAL STRATEGIES AND PLANS OR REPORTS AND ASSESSMENTS UNDER RELEVANT CONVENTIONS, IF APPLICABLE, I.E. NAPAS, NAPS, NBSAPS, NATIONAL COMMUNICATIONS, TNAS, NIPS, PRSPS, NPFE, ETC.:

<sup>5</sup> Same as footnote #3.

This project is complementing the *Sierra Leone National Energy Policy* and *Sierra Leone National Energy Strategic Plan*, established by the Government in September 2009. The policy objective, priorities and ultimate goal of the Government of Sierra Leone is to ensure the provision and access to modern energy services for improving economic growth, productivity, wealth creation and improved quality of life for all Sierra Leoneans.

The identified priorities are:

- In order to address the problem of limited access to electricity in the country, the policy is geared towards increasing supply, through a comprehensive reform of the power sector, including liberalization of the energy supply sub-sector, attracting private investment and involvement and putting in place more effective mechanisms for monitoring and control;
- The policy is aimed at further exploiting the vast renewable energy potential in hydropower and solar energy, as well as in using agricultural waste to provide much needed modern energy;
- The policy addresses the need for increasing access, improving efficiency, promoting the use of more efficient and cleaner energy sources and equipment, as well as of widely available renewable energy resources;
- For the household sub-sector, emphasis is on the promotion of LPG as a cooking fuel (mainly in urban areas) as well as wider dissemination of fuel-saving stoves (improved cookstoves), and the adoption of renewable technologies. For agriculture and fisheries the need for the provision of energy sources including renewable energy sources to stimulate mechanization is addressed. In the commercial sub-sector, focus is on more efficient energy devices for communal cooking and heating and for lighting. Access to electricity is the major consideration for the industrial and mining sub-sectors, while for the transport sub-sector; fuel economy; alternative fuels and environmental concerns are given considerable attention.

In addition to these sub-sectors the policy also addresses the cross-cutting issues that are important to consider in dealing with energy, in general. These are: energy and gender; research and development; human resources capacity building and development; information and awareness creation; energy efficiency and rural energy.

The Second National Communication is still under development. But the Initial National Communication (INC, 2007) highlighted that the Land Use Change and Forestry sector is the major source of GHG emissions. Sierra Leone's energy use is characterized by the dominance of traditional fuels (firewood and charcoal) in the domestic sector largely for cooking. Traditional fuels represent over 80% of primary energy consumption in the domestic sector. The major areas of charcoal production have become heavily exploited. As much as 30% of the wood harvested is converted to charcoal.

There were several mitigation measures that were proposed in the INC to reduce GHG emissions. Among them are the following:

- Fuel switching and promotion of renewable energy
- Development of alternative energy sources such as Bio-fuels
- Forestry protection, conservation and increase
- Reforestation, afforestation and Agroforestry

The proposed GEF-assisted project is in line with the climate change mitigation actions stated in INC.

## **B. PROJECT OVERVIEW:**

### **B.1. DESCRIBE THE BASELINE PROJECT AND THE PROBLEM THAT IT SEEKS TO ADDRESS:**

Most of the energy production and use in Sierra Leone (SL) is concentrated in the household sub-sector, where biomass, in the form of unsustainable fuelwood and charcoal is used for cooking and kerosene is used for lighting. The primary energy supply of SL in 2010 consisted of 84% biomass and 16% oil. The greatest RE potential are biomass and hydro followed by solar, wind and ocean. Current charcoal production systems are inefficient adding further pressure on the fragile forest resources. Traditional cookstoves are inefficient and cause health hazards especially to women and children and GHG emissions. The three-stone stove (open fire stove), metal stove commonly called “Coal pot” and the kerosene stoves are the three kinds of stoves used. The three-stone stove is used by 90% of households. This stove and the “coal pot” stove have the following drawbacks: dispersion of the flames and heat during windy conditions, lost through lack of proper control over the fire, exposure to heat and smoke as well as fire hazard, as such are very inefficient. The entire rural population and over 95% of the urban population (meaning 92% of the total population) use solid fuel for cooking. 85% of the stoves use wood as fuel, while 14% uses charcoal and 1% for kerosene. It is estimated that there is on average 500 charcoal burners in Sierra Leone, producing about 400 tons per year using traditional open pits (inefficient kilns). The total population of Sierra Leone is 5.4 million inhabitants, 38% are estimated to be urban and 62% are rural population. With an average household size of 6, the estimated number of traditional cookstoves is 1 million. All these baseline data will be detailed and beefed up during the PPG phase.<sup>6</sup>

The following are some undergoing initiatives and planned programs on biomass utilization in the country:

**WAPFR (Conservation of the Western Area Peninsula Forest Reserve) and its Watersheds** (budget: US \$3 million; implementation period is 2009 – 2014)

In the 1950s, more than 60% of Sierra Leone was covered by closed high forests. Today, just 5% (180,250 ha) of these forests remain. A drastic decrease in ecosystem biodiversity went along with the loss of forest habitats. The main identified reasons for this decrease in ecosystem are fuel wood, charcoal and poles extraction. In fact, on a daily basis, one can see many heavy-laden truckloads of fuel wood and charcoal being brought to the city of Freetown from the Western Area Peninsular Forest and other part of the country. The Western Area Peninsula (WAPFR), part of the Upper Guinean Forest Ecosystem, is home to up to 1.5 million people (20% of the country’s total population), including the city of Freetown. The WAPFR covers about 17,000 ha of closed forest (in 2011), and its deforestation rate is estimated to be 2% annually.

WAPFR is a Government project, funded by EU, and its overall objective is to introduce participatory processes in decision making on the sustainable use of natural resources that contribute to the reduction of rural poverty in the Western Area Peninsula and to conserve and sustainably manage the Sierra Leonean Western Area Peninsula Forest Reserve (WAPFR) and its watershed. This project also intends to build a new and final boundary of the forest reserve with an official enforcement of this boundary.

The WAPFR project has synergies with the EU funded projects for the Freetown Development Plan (FDP) as well as with two projects, implemented by International NGOs that focus on urban and sub-urban agriculture and are financed through the Food Security Thematic Plan.

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<sup>6</sup> Source: UNDP & FAO

The WAPFR is implemented by EPA-SL (Environment Protection Agency – Sierra Leone) and has a \$3 million budget and its implementation period is 2009 - 2014. The proposed GEF project will enhance the activities under this project in order to generate significant global environmental benefits, one of which is ensuring that charcoal production is not leading to continuous deforestation.

The entire WAPFR project is the baseline project of the proposed GEF project, particularly the following activities:

- Strengthening the law enforcement instruments (Forest Department, community policing) and promote the establishment of an institutional framework for coordination among agencies on related matters
- Encouraging farmers to adopt agroforestry, (certified) woodlot planting and sustainable forest management in a buffer zone in order to increase the supply of (certified) fuel wood
- Strengthening civil society organizations active in the protection of natural resources e.g. support self-help groups and associations, training of individuals (youth and women)
- Development of a micro-finance program (through a credit institution), giving the possibility to substitute fuel wood/charcoal selling as an income source for the poor

**Toyola Energy, a regional private sector initiative** (budget: US \$1.5 million; implementation period starting in 2013)

Toyola Energy is a successful experience in Ghana, and is now intending to be spread in West African countries, mainly through a south-south technology transfer. This company has produced more than 150,000 cook stoves across Ghana and its neighboring countries, benefiting around 940,000 people.

To make these cook stoves more affordable, Toyola used a well-adapted funding mechanism that offers potential ICS users the option to buy on credit and pay back their loan over two months using the money saved on charcoal, with many keeping their savings in another innovative concept: “Toyola Money Box”<sup>7</sup>. The improved cook stoves cost on average \$7 each. Toyola plans to install cook stove production units in Sierra Leone starting in 2013.

The proposed GEF project will support this initiative, by strengthening the “Money Box” scheme and ensuring that ICS are widely spread in rural and peri-urban communities.

**UNDP Poverty Reduction and Energy Program (PREP)** (budget: US \$2 million; implementation period is 2012 – 2016)

Sierra Leone has joined the PREP program in 2011. This initiative intends to develop a big program on modern energy access. There are several components under this program, along with renewable Energy, Energy Efficiency and Multifunctional Platforms.

Under the sustainable management of forest resources component of this project (*Sustainable management of forest resources and improving the efficiency of charcoal production*) a model of ICS, and plans to distribute 10,000 units of this model are planned. This project activity will be used as baseline for the development and production of ICS that will be carried out under the proposed GEF project.

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<sup>7</sup> The “Money Box” is a tin with a slot. Toyola gives his customers the stoves on credit, and they pay him out of the savings they make from reduced charcoal consumption. In Ghana where this experience began, 3 of 4 customers used this money box mechanism.

## **EPA-SL – Technical Assistance & Capacity Building for the Sierra Leone Environmental Protection Agency (budget: US\$ 1.3 million; implementation period is 2010 – 2014)**

The overall objective of this EU-funded program is strengthening the institutional/organizational setup and builds the capacity of the Environment Protection Agency- Sierra Leone (EPA-SL) to effectively deliver on its mandate and therefore assisting the government in the necessary update of the country's environmental policies and sector legislation. The implementation of the EPA-SL project started in the 3rd quarter 2010 and is currently ongoing. Specific activities of this project such as those aimed at strengthening the EPA-SL's capacity on environmental policies, in general, and renewable energy, in particular; and the capacity of the related ministries (Energy, Forestry and Environment) on RE policies and sustainable charcoal and ICS technologies will be subsumed into the proposed GEF project. These baseline activities will be further enhanced with additional training, awareness raising and information dissemination to sensitize public and private stakeholders and government policy and decision makers to support the approval and enforcement of these policies, rules and regulations that support on the sustainable and efficient use of renewable biomass.

### **Identified barriers:**

While the above mentioned baseline projects will address a number of relevant issues, many barriers will remain that need to be addressed. Following a series of stakeholders' consultations, a number of barriers was identified and classified by thematic areas: Institutional and policy related barriers, financial and market related barriers and information and awareness related barriers. Based on the barrier analysis that was performed, the various proposed GEF project components were defined, and the expected outcome(s) and outputs for each component identified. Each component is addressing one thematic barrier. Component 1 is intended to remove institutional and policy related barriers. Component 2 intends to remove financial and market related barriers. And component 3 is for addressing the information and awareness related barriers.

The following summarizes the results of the barrier analysis that was conducted.

### **Institutional and Policy related barriers**

- Insufficient capacity of relevant stakeholders (government, institutions, national agencies) to formulate and enforce policy and regulatory frameworks on biomass resource in an integrated manner, especially the use of sustainable, improved and more efficiently produced charcoal and improved cook stoves
- Unclear mandates and lack of coordination in managing the development and utilization of biomass energy technology applications among government departments and national agencies
- Lack of adequate policies on biomass resource
- Absence of an appropriate legal and regulatory framework on the use of sustainable charcoal and improved cook stoves)

Institutional and policy related barriers will be removed through activities under Component 1.

### **Financial and Market related barriers**

- Weak coordination and cooperation between the public and private sectors due to lack of opportunities and lack of trust
- Insufficient knowledge of the application of appropriate sustainable charcoal and improved cook stoves technologies

- No opportunities to invest in the improved more efficient production of charcoal and improved cook stoves
- Insufficient capacity of relevant stakeholders to determine end-users capacity and willingness to pay for certified charcoal and certified improved cook stoves
- The market of improved, more efficiently produced, charcoal and improved cook stoves is not developed
- Lack of financing and funding mechanisms for sustainable charcoal and improved cook stoves investment
- Inhibition of the growth of commercially viable biomass resource technologies in the country
- Lack of tested ICS models for a successful investment

The financial and market related barriers will be removed through activities under Component 2.

### **Information and Awareness related barriers**

- Insufficient knowledge at country level about efficiently produced charcoal and ICS benefits and available technologies among various stakeholders (government, private companies, producers, farmers, villagers, women, consumers, collectors)
- Lack of knowledge and negative perception (lack of or limited social and cultural acceptance) on the use of new technologies for cooking
- Lack of most appropriate service delivery model based on existing best practices

The information and awareness related barriers will be removed through activities under Component 3. From the above listed barriers, 7 will be removed by GEF incremental activities, and 8 will be removed through baseline activities. Indicative baseline related activities are indicated in the table below.

Barriers to be overcome by baseline activities	Indicative baseline related Outputs/Activities
(1) Unclear mandates and lack of coordination in managing the development and utilization of biomass energy technology applications among government departments and national agencies	Strengthening of civil society organizations active in the protection of natural resources e.g. support self-help groups and associations, training of individuals (youth and women) (WAPFR)
(2) Lack of adequate policies on biomass resource	Strengthening of the law enforcement instruments (Forest Department, community policing) and promote the establishment of an institutional framework for coordination among agencies on related matters (WAPFR)
(3) Weak coordination and cooperation between the public and private sectors due to lack of opportunities and lack of trust	Establishment of public private partnerships (Addax) <sup>8</sup>
(4) Insufficient knowledge of the application of appropriate sustainable charcoal and improved cook stoves technologies	Design and installation of improved cook stove production (Toyola)
(5) No opportunities to invest in the improved more efficient production of charcoal and improved cook stoves	Development of a micro-finance program (through a credit institution), giving the possibility to substitute fuel wood/charcoal selling as an income source for the poor (WAPFR)
(6) Inhibition of the growth of commercially viable biomass resource technologies in the country	Formulation of policy and regulatory framework for the standardization and certification of biomass (Addax)

<sup>8</sup> Addax Bioenergy is an international private company and is developing a Greenfield renewable energy and agriculture project at Makeni (center Sierra Leone). Its activities that involve the formulation of policy and regulatory framework for the standardization and certification of biomass are subsumed into the proposed GEF project, and will be enhanced with incremental activities that will facilitate the approval and enforcement of such policies, inclusive of those targeted for the production and use of sustainable charcoal and ICSs.



Barriers to be overcome by baseline activities	Indicative baseline related Outputs/Activities
(7) Lack of tested ICS models for a successful investment	Distribution of 10,000 units of ICS through Sustainable management of forest resources and improving the efficiency of charcoal production (PREP)
(8) Lack of most appropriate service delivery model based on existing best practices	Encouragement of g farmers to adopt agroforestry, (certified) woodlot planting and sustainable forest management in a buffer zone in order to increase the supply of (certified) fuel wood (WAPFR)

Indicative incremental related outputs are indicated in the table below:

Barriers to be overcome by incremental activities	Indicative incremental related Outputs
(1) Insufficient capacity of relevant stakeholders (government, institutions, national agencies) to formulate and enforce policy and regulatory frameworks on biomass resource in an integrated manner, especially the use of sustainable, improved and more efficiently produced charcoal and improved cook stoves	Output 1.1: Adequately trained and capable decision-makers and relevant stakeholders (from EPA-SL, ministries, private sector, rural communities, etc.) leading efforts, communicating and managing biomass utilization in an integrated manner
(2) Absence of an appropriate legal and regulatory framework on the use of sustainable charcoal and improved cook stoves)	Output 1.2: Formulated, approved and enforced policies, laws and regulations on biomass Output 1.3: Formulated, approved and implemented incentive schemes for biomass energy technology applications Output 1.4: Formulated, approved, controlled and enforced policies, laws and regulations for the use of kilns and ICSs
(3) Insufficient capacity of relevant stakeholders to determine end-users capacity and willingness to pay for certified charcoal and certified improved cook stoves	Output 2.1: Established partnerships between the public and private stakeholders involved in the value chain of biomass production and utilization Output 2.5: Developed inclusive supply and value chains for improved charcoal production and ICS use
(4) The market of improved, more efficiently produced, charcoal and improved cook stoves is not developed	Output 2.4: Designed and implemented large scale program for the financing of 1,000 energy efficient charcoal kilns and 15,000 improved cook stoves
(5) Lack of financing and funding mechanisms for sustainable charcoal and improved cook stoves investment	Output 2.2: Developed incentives through carbon finance and microfinance to scale up charcoal and ICS commercialization
(6) Insufficient knowledge at country level about efficiently produced charcoal and ICS benefits and available technologies among various stakeholders (government, private companies, producers, farmers, villagers, women, consumers, collectors)	Output 3.3: Sensitized key value chain actors through public awareness campaign and capacity development
(7) Lack of knowledge and negative perception (lack of or limited social and cultural acceptance) on the use of new technologies for cooking	Output 3.1: Developed gender sensitive capacity development and modules for the production and utilization of certified charcoal and ICS Output 3.2: Developed and implemented promotional schemes on the social, economic and environmental co-benefits of improved charcoal and improved cook stoves to generate good buy-in and willingness to pay

**B. 2. INCREMENTAL /ADDITIONAL COST REASONING: DESCRIBE THE INCREMENTAL (GEF TRUST FUND) OR ADDITIONAL (LDCF/SCCF) ACTIVITIES REQUESTED FOR GEF/LDCF/SCCF FINANCING AND THE ASSOCIATED GLOBAL ENVIRONMENTAL BENEFITS (GEF TRUST FUND) OR ASSOCIATED ADAPTATION BENEFITS (LDCF/SCCF) TO BE DELIVERED BY THE PROJECT:**

The project goal is the reduction of the growth of GHG emissions from the domestic energy use sector. The project objective is the improved and more efficient use of biomass energy resources through the application of more efficient charcoal production and improved cook stoves. The project aims to:

- (i) Create an enabling environment for the production and use of sustainable, energy efficient kilns and improved cook stoves;
- (ii) Support a first large scale deployment of these technologies; and
- (iii) Ensure that the subsequent national transformational diffusion of these technologies will be ensured by setting up sustainable financial mechanisms and tools for investment.

The proposed project envisioned is comprised of 3 components each of which will help realize a set of outcomes that will contribute to the achievement of the project objective.

The GEF funds will be used for incremental activities designed to remove the identified barriers. In particular, the GEF funds will be used for those incremental activities that expand the scope of, or supplement, the baseline activities in leading to or enhancing global environmental benefits.

The following enumerates what would happen if this project will not proceed: (1) Limited efforts will be carried out to promote the use of ICS and more efficiently produced charcoal. Once the initiative is completed, follow-up actions are not expected and changes in the local cooking habits and practices (in terms of energy use) will be minimal, as well as in the application of more energy efficient and convenient ways of cooking; (2) Since there will be no obligation for the consumers to use more expensive ICS and more efficiently produced charcoal the current wasteful use of traditional fuels (e.g., unsustainable firewood and charcoal) will continue to the detriment of the country's remaining forested areas; (3) No development of the market for certified ICS and charcoal; (4) Limited financing for prospective businesses on the manufacture and sales of ICS and efficiently produced charcoal; (5) Limited knowledge in the manufacture of ICS and efficiently produced charcoal. In general, apart from the other barriers that cannot be removed, or at least minimized, the very limited efforts and knowhow of this post-conflict country in following through whatever baseline initiatives supported by some private sector entities and those that are foreign aid-assisted, will gradually negate whatever gains that will be realized from the baseline activities if the much needed incremental assistance for barrier removal will not materialize.

The different components are described below:

**Component 1: Policy/regulatory frameworks on the use of more efficiently produced charcoal and improved cook stoves**

This component seeks to develop institutional top down and bottom up participatory approach to identify and map out renewable and non-renewable biomass resources in Sierra Leone. Institutional and regulatory and standardization of charcoal and cookstove will be strengthened to provide consumer confidence and quality products.

The expected outcomes from Component 1 activities are: (1) Strengthened institutional capacity on biomass resource utilization at the national, regional and community level; and, (2) Operational effective policy, legal, and regulatory frameworks and review mechanisms on biomass energy technology

applications. The activities that will be carried out under this project component builds on the baseline WAPFR, and the EPA-SL project activities and will focus on the enforcement of policies, laws and regulations on biomass production and utilization. The capacity of decision-makers and relevant stakeholders (from EPA-SL, ministries, private sector, rural communities, etc.) will be enhanced to enable them to lead efforts, communicate and manage more efficient biomass utilization in an integrated manner. Financial instruments will be developed (such as “money box”, exchange mechanism between traditional and improved cook stoves, tax exemptions, etc.). The GEF support under this project component will be mainly used for the technical assistance on the review and analysis of policies, laws and regulations on more efficient charcoal production and utilization, and the formulation of enhanced policies and support frameworks. The 2 outcomes will be realized with the delivery of the following expected outputs:

- 1.1 Adequately trained and capable decision-makers and relevant stakeholders (from EPA-SL, ministries, private sector, rural communities, etc.) leading efforts, communicating and managing more efficiently produced charcoal and improved cookstove utilization in an integrated manner
- 1.2 Formulated, approved and enforced policies, laws and regulations on more efficient charcoal production and utilization
- 1.3 Formulated, approved and implemented incentive schemes for more efficiently produced charcoal and improved cookstove technology
- 1.4 Formulated, approved, controlled and enforced policies, laws and regulations for the use of more efficient kilns and ICSs
- 1.5 Reviewed lessons learnt in the financing and scaling up of more efficiently produced charcoal, and ICS production
- 1.6 Developed standards and certification for more efficiently produced charcoal and improved cookstove

## **Component 2: Development of public-private initiatives for the improved and more efficient production of charcoal and the scaling up of improved cookstove production**

This component seeks to sustain the production of certified charcoal and certified cookstove beyond the proposed GEF project, with innovative public and private initiatives to be developed to phase out the initial subsidy. The envisioned activities will build on the baseline activities from the WAPFR, Toyola Energy and UNDP PREP projects and includes the definition of the certification criteria for more efficiently produced charcoal. The scope of the certification process will cover also the improved cook stoves production. Carbon finance will be leveraged and a feasible and suitable microfinance scheme will be developed to support the scale up of the production of more efficiently produced charcoal and improved cook stoves. The objective of the establishment of these enabling conditions is the replacement of traditional cook stoves at country level. As part of such enabling environment, Incentives will be developed and designed in such a way to motivate users of traditional cook stoves in the country to change to ICS, and to also encourage the increased local manufacturing and sales of efficiently produced charcoal fuel and ICS. The envisioned incentives for encouraging increased investments in the commercial production of more efficiently produced charcoal and ICS is in line with the objective of replacement of traditional cook stoves all over the country. The pertinent feasible incentives will be identified and the implementation mechanisms fully designed during the PPG exercise. Such incentives and the modalities by which these will be implemented will be fully defined and described at CEO endorsement.

This component will also involve the conduct of a value chain analysis (harvesting/charcoaling, transport, retailing and consumption) to identify appropriate interventions along the supply chain from farmer to consumer to support development of more inclusive supply chains for charcoal and improved cook stoves. Under this component, the GEF support will be mainly for the acquisition of equipment for the production of the prototype ICSs, and the seed money for the financing scheme for supporting the large scale manufacturing of improved cook stoves and installation of sustainable charcoal production kilns. The GEF will also support the detailed analysis for the development of incentives, the phase-out of traditional cookstoves and the initial implementation of these incentives. Increased investment on improved, more efficient charcoal and ICS productions in Sierra Leone is the expected outcome in Component 2, and it will be realized with the achievement of the following expected deliverables:

- 2.1 Established partnerships between the public and private stakeholders involved in the value chain of charcoal production and utilization
- 2.2 Developed incentives<sup>9</sup> through carbon finance and microfinance to scale up more efficient charcoal and ICS production and commercialization
- 2.3 Three (3) tested prototypes<sup>10</sup> of improved cook stoves that are promoted for commercial production and widespread application
- 2.4 Designed and implemented large scale program for the financing of 1,000 energy efficient charcoal kilns and 15,000 improved cook stoves<sup>11</sup>
- 2.5 Developed inclusive supply and value chains for improved charcoal production and ICS use
- 2.6 Adequately capable local entrepreneurs producing certified charcoal and certified improved cook stoves
- 2.7 Established and operational framework for the phase-out of traditional cookstoves

### **Component 3 - Improved and efficient production and utilization of charcoal and cookstoves**

This component seeks to strengthen the technical, financial and regulatory, institutional and gender capacity of the public and private stakeholders in the scaling up of efficiently produced charcoal and improved cookstoves. Financial incentive mechanisms and technology transfer (south-south) will be enhanced. Component 3 will comprise of activities that will deliver outputs that will contribute to the realization of the following expected outcomes: (1) The production and utilization of certified charcoal and certified improved cook stoves are common practices in Sierra Leone; and (2) Enhanced capacity of stakeholder in the value chain (producers, villagers, women, consumers, collectors). The indicative activities are mainly enhancements of the baseline activities from the WAFPR and EPA-SL projects and will focus on the production and utilization of certified charcoal and ICS, These include: (a) development of gender sensitive capacity building programs on the production and utilization of charcoal and ICS; (b) development of innovative schemes to realize the social, economic and environmental co-benefits of efficiently produced charcoal and improved cook stoves; (c) establishment of partnerships between the

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<sup>9</sup> This is in line with the achievement of the objective of replacement of traditional cook stoves all over the country.

<sup>10</sup> There will be prototypes for both firewood and charcoal based combustion. The ICS firewood based model will be spread in areas where there is no culture of buying charcoal

<sup>11</sup> Since one of the objective of the project will be the design and setting in place of a sustainable mechanisms incentivizing the replacement of cook stove at country level, the demonstrations of output 2.4 will be using and testing such mechanism (to prepare for a larger scale implementation).

public and private stakeholders involved in the value chain of the entire sector of charcoal production and utilization; and, (d) development of financial mechanisms and tools for investment in the sustainable supply of efficiently produced charcoal, as well as in the production of ICS. The requested GEF support will be mainly for the technical assistance in ensuring the efficient production of charcoal and ICS production. The expected outputs from these activities include:

- 3.1 Developed gender sensitive capacity development and modules for the production and utilization of certified charcoal and ICS
- 3.2 Developed and implemented promotional schemes on the social, economic and environmental co-benefits of improved, more efficiently produced charcoal and improved cook stoves to generate good buy-in and willingness to pay
- 3.3 Sensitized key value chain actors through public awareness campaign and capacity development

### **Cost effectiveness**

A very preliminary and conservative estimate indicates that the total direct project CO<sub>2</sub> emissions reduction from the deployment of 1,000 energy efficient charcoal kilns and the dissemination of 15,000 improved cook stoves under the project is 2,526,800 tons. A very small portion of this (2.7%) is the 64,400 tons CO<sub>2</sub> emission reduction from the use of 15,000 units of ICS<sup>12</sup>. The rest are from the deployment of 1,000 units of improved charcoal kilns (Retorts model). The lifetime CO<sub>2</sub> emission reduction from the Adam Retorts (15 years) is 2,462,400 tons (net of losses)<sup>13</sup>. Considering the US\$ 1,768,182 from the GEF as support for this project, the unit abatement cost is about 1,768,182 / 2,526,800 = US\$ 0.7 per ton of CO<sub>2</sub> reduced.

### **B.3. DESCRIBE THE SOCIOECONOMIC 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 ENVIRONMENT BENEFITS(GEF TRUST FUND) OR ADAPTATION BENEFITS (LDCF/SCCF). AS BACKGROUND INFORMATION, READ [MAINSTREAMING GENDER AT THE GEF.](#)"**

In the everyday life of a Sierra Leonean, energy plays a crucial role in providing options for cooking, transportation, education, health services, etc. However, there is a real gap in the provision of energy between the urban and peri-urban and that of the rural communities where the availability and affordability of clean energy is a daily challenge. In those areas, wood, biomass and agricultural waste provide most of the energy that is available, and there is little access to electricity or modern fuels for cooking, heating, mechanized equipment or motor vehicles.

The introduction of improved cookstoves will allow the population to save some money that would have gone in buying charcoal for cooking (especially for users of traditional cookstoves running with

<sup>12</sup> Improved Cook Stoves: Average annual ICS charcoal consumption = 0.17 ton; Average CO<sub>2</sub> emission reduction from ICS use = 1.4 tons; Average ICS lifetime = 3 years.

<sup>13</sup> Energy Efficient Charcoal Kilns: Average Charcoal-to-Wood Ratios – Adams Retort (15 years useful life) = 0.385; Casamance Kiln (5 years useful life) = 0.25; Average annual production from Adam Retorts is 24 tons of charcoal; for Casamance it is 9.6 tons of charcoal; Optimized charcoal production from use of Adam Retorts can entirely avoid the emissions of CH<sub>4</sub> from pyrolytic gases resulting from traditional processes. Avoiding CH<sub>4</sub> emissions through such a technology represents an emission reduction of roughly 3.5 tons CO<sub>2</sub>e per ton of charcoal produced; Based on data from a leading study, with a conservative estimate of the percentage carbon content in wood, the CO<sub>2</sub> reduction conversion factor savings from avoiding the use of non-renewable biomass represents an emission reduction of roughly 3.7 tons CO<sub>2</sub>e per ton of charcoal produced (*Bailis, Modeling climate change mitigation from alternative methods of charcoal production in Kenya, 2009*); Total losses (i.e., production facility, charcoal transport, and distribution to consumers) do not exceed 5%.

charcoal). Energy efficient cookstoves will as well improve women and children, thus family health, by preventing respiratory related diseases due to cooking smokes. Current cooking practices in Sierra Leone produce lots of smokes which are likely to be responsible for lung diseases. ICS will also reduce the time of going for wood collection.

In Sierra Leone like many African countries, there are prescribed roles for women/children and men; and access to energy is seen differently by men and women/children. The proposed project will address gender mainstreaming at different levels. It will look at the policy and formal institutional level to improve gender equality and its associated challenges are visible; the project will promote gender equality and women's empowerment and opportunities will be made available for women. It will have some sets of indicators to ensure the benchmarks are achieved and these include:

- Improve the roles of women as decision makers on communities' level and is accepted by all;
- Advancement of women's access to energy resources and a control over its uses;
- Encourage the visibility and empowerment of women;
- Involvement of women and children in the education and other socio-economic activities of the communities;
- Increased training and capacity building of women on access to efficient and affordable green energy sources;
- Improved health and education status of women and children.

The project is closely linked to the attainment of the country's MDGs.

**B.4: INDICATE RISKS, INCLUDING CLIMATE CHANGE RISKS THAT MIGHT PREVENT THE PROJECT OBJECTIVES FROM BEING ACHIEVED, AND IF POSSIBLE, PROPOSE MEASURES THAT ADDRESS THESE RISKS TO BE FURTHER DEVELOPED DURING THE PROJECT DESIGN:**

The following risks are identified but will be addressed and minimized through appropriate mitigation measures.

Risk	Level of Risk	Mitigation Action
Technology risks related to the technologies to introduce; in particular the kilns and their operation. Although the project will be going to establish proven technologies, there might still be risks involved, such as the type of kilns proposed could prove to be unsuitable for the designated areas	Moderate	The project intends to utilize proven feasible and affordable technologies and duplicate solutions that have been successfully introduced in several countries in the region. The project will establish a south-south technology transfer commercial production of ICS. Successful private sector initiatives in neighboring countries (example: Ghana) has developed and spread Toyola cookstoves (a well know ICS in West Africa). These initiatives will be reproduced in Sierra Leone. On the kiln type, the PPG phase will help to define the suitable type that suits the local Sierra Leone conditions
Social risk: there will be limited social and/or cultural acceptance (this applies in particular to the ICS, as people will have to adjust their behaviors, which is notoriously difficult to achieve). Although the project plans to address this directly, there might still be aspects of it that will be out of control.	High	The PPG phase will come up with detailed analysis of the socio-economic interest of using improved cook stove. However, if a particular community/village does not want to change its cook habits, the project will emphasize the benefices of ICS and bring examples of communities/villages that adopted the ICS.



Risk	Level of Risk	Mitigation Action
Economic/financial risk: risks of lack of affordability, limited supply of feedstock (in particular if we would want to restrict the use of renewable biomass, or waste products) making the kilns less viable to operate; the risk of the government introducing alternative, cheaper, perhaps subsidized fuels, like LPG (this is mentioned as a priority in the initial NC!); making charcoal based systems less viable and attractive.	High	The project will define the economic benefits of more efficient kilns and improved cook stoves. A feasible and suitable microfinance scheme will be developed to support the scale up of the production. However, if an unexpected lack of affordability of kilns and ICS occurs due to local Government measures, the project will emphasize on international affordability such as carbon market. Output 2.2 intends to leverage carbon finance.
Regulatory framework: The enactment of the proposed regulatory framework and standardization of charcoal and cookstoves faces many delays Political will: any change in this can be problematic because the success of this project will be determined to a large degree on effective enforcement, which will not be possible without strong political will.	Low	Having realized the co-benefit of the interventions, the Government buy in will play a central role in this proposed project and there is strong political will to improve the enabling policy and regulatory framework for encouraging investments in standardization and certification of charcoal and cookstoves.
Environmental risk: the project will encourage/accelerate degradation and deforestation. The introduction of improved kilns in charcoal-producing areas could create a perverse incentive of more and uncontrolled production of charcoal	Medium	Specific criteria will be developed to validate the areas that can support the implantation of more efficient kilns. Among these criteria: available harvested firewood resources, secure land tenure, access to markets, and past charcoal production experience.
Climate Change risk - Climate change is expected to change Sierra Leone's biomass production, accelerates land degradation, and modifies the hydrological systems. However, this is a longer-term risk. If the effects of this will be experienced during the project implementation, any potential operation of the project woodlots and biomass production can be affected.	Low	While the project will promote and influence the application of low carbon solutions and access to modern energy that will alleviate the human pressure on biomass production, sufficient buffer zone around woodlots will be established to ensure proper protection against major rainfalls and/or floods <sup>14</sup> .
<b>Overall Risk Level</b>	Moderate	

<sup>14</sup> Sierra Leone is vulnerable to heavy rain falls and floods, especially the Western Peninsula area. The woodlots will be established in this part of the country particularly around the former stone quarrying areas. These former quarrying areas can provide protection to the woodlots, serving as buffer zones. Such buffer zones are effective barriers against water inundation. It should be noted that the Western Peninsula used to be a stone quarrying/mining area and many rocks that are still there will be used to ring the buffer zones.

**B.5. IDENTIFY KEY STAKEHOLDERS INVOLVED IN THE PROJECT INCLUDING THE PRIVATE SECTOR, CIVIL SOCIETY ORGANIZATIONS, LOCAL AND INDIGENOUS COMMUNITIES, AND THEIR RESPECTIVE ROLES, AS APPLICABLE:**

The following table lists the stakeholders of the proposed GEF project. Included in the list are the summary of expected roles of each stakeholder in the design, development, implementation and management of the proposed project.

Stakeholders	Expected role
<b>EPA- SL (Environment Protection Agency - Sierra Leone)</b>	<ul style="list-style-type: none"> <li>• Coordination of the overall project implementation and management;</li> <li>• Ensure the coordination between Institutional and human resources during capacity building sessions</li> <li>• Support the creation and production of informative material about standardization and certification of charcoal and cookstoves (leaflets, guide books, videos, etc.)</li> </ul>
<b>Ministry of Energy and Water Resources</b>	<ul style="list-style-type: none"> <li>• Carry out the institutional and human resources capacity building in climate change and Low carbon Energy Access;</li> <li>• Lead the update and implementation of the <i>National Energy Policy and Strategic Plan</i>.</li> <li>• Assist technicians and scientists on identification and development of new types of cookstoves</li> <li>• Support local communities in the planning, implementation and monitoring of the demonstrations on ICS use</li> <li>• Assist the project in the creation and production of informative material about sustainable charcoal and ICS (leaflets, guide books, videos, etc.)</li> </ul>
<b>Ministries of Forestry</b>	<ul style="list-style-type: none"> <li>• Assist technicians and scientists on mapping and assessment of biomass potential</li> <li>• Assist technicians and scientists on the identification and development of new types of charcoal and kilns</li> <li>• Determine community woodlots and their certification criteria</li> </ul>
<b>Ministry of Finance</b>	<ul style="list-style-type: none"> <li>• Lead and provide guidance on the conception phase of the financial mechanisms and incentives</li> <li>• Assist in the establishment and operationalization of financial mechanisms and incentives</li> </ul>
<b>UNDP Sierra Leone</b>	<ul style="list-style-type: none"> <li>• Provision of technical and management support to the project</li> <li>• Provision of M&amp;E to the project</li> <li>• Provision of knowledge management tools for data and experience sharing</li> <li>• Conduct of human and institutional capacity development activities</li> <li>• Development of key policies and strategies for the project implementation</li> </ul>
<b>Private sector</b>	<ul style="list-style-type: none"> <li>• Provide investment flows to the project</li> <li>• Ensure technology transfer and know-how</li> <li>• Ensure initiative sustainability</li> </ul>
<b>Research institutes</b>	<ul style="list-style-type: none"> <li>• Conduct of required project researches</li> <li>• Creation of partnerships on new ventures on sustainable charcoal and ICS productions</li> <li>• Creation of innovative schemes and actions for project inclusion</li> <li>• Conduct of the sensitization drives of the project</li> </ul>
<b>University of Sierra Leone</b>	<ul style="list-style-type: none"> <li>• Conduct of required project researches</li> <li>• Creation of partnership on project execution</li> <li>• Provision of interns to work on project activities</li> <li>• Inclusion of best practices into curricula</li> <li>• Conduct of tailor-made learning programs on biomass resource utilization, in</li> </ul>



Stakeholders	Expected role
	particular sustainable charcoal and ICS
<b>Local communities organization</b>	<ul style="list-style-type: none"> <li>• Promotion of demonstration sub activities</li> <li>• Organization and conduct of awareness raising campaigns</li> <li>• Ensure good buy-in from direct beneficiaries of the project</li> </ul>
<b>Women organization</b>	<ul style="list-style-type: none"> <li>• Capacity building and creation of culture of change to address the poverty-energy nexus</li> <li>• Ensure good buy-in from direct beneficiaries of the project</li> <li>• Participation in community stakeholders and ownership committee</li> <li>• Combat the negative perception on the use of new technologies for cooking</li> </ul>

Consultation with these stakeholders will be organized during the PPG phase to evaluate their capacities and capabilities and identify main roles in the project.

#### **B.6. OUTLINE THE COORDINATION WITH OTHER RELATED INITIATIVES:**

During the PPG phase, in-depth consultations will be undertaken to establish partnerships and practical modalities for linking and collaborating with several ongoing and planned sustainable biomass related projects/programs in Sierra Leone. Initial discussions were conducted with the implementers/owners of the identified relevant projects that are ongoing and planned in the country, particularly those that will be used as baseline for the proposed GEF project. A strategy and plan for collaboration with relevant ongoing and planned initiatives such as those stated below will be prepared during the preparatory phase. It will include the delineation of the roles and responsibilities of the project implementers and owners, the scheduling of the baseline activities, the arrangements for the monitoring and reporting of results of the baseline activities that they will implement, and the joint evaluation of the results and outcomes of the baseline and incremental activities. The CEO endorsement request document will include a detailed description of the coordination mechanism.

- WAPFR (Conservation of the Western Area Peninsula Forest Reserve) and its Watersheds: this is the baseline project of the proposed GEF project. The proposed GEF project will enhance the activities under the WAPFR project in order to generate significant global environmental benefits, one of which is ensuring that charcoal production is not leading to continuous or accelerated deforestation.
- UNDP planned program on energy access through the Multifunctional Program (MFP) and UNDP planned Investment Program for Access to Modern Energy Services under the regional program PREP (Poverty Reduction and Energy Programme). The MFP program is a regional UNDP program in West Africa on access to modern energy. The sustainable management of forest resources and improving the efficiency of charcoal production of this project is used as baseline for the development and production of ICS that will be carried out under the proposed GEF project.

#### **C. DESCRIBE THE GEF AGENCY’S COMPARATIVE ADVANTAGE TO IMPLEMENT THIS PROJECT:**

The proposed project is within the comparative advantages of UNDP as stated in the GEF Council Paper C.31.5 “*Comparative Advantages of GEF Agencies*”. UNDP has a local presence through its Country Office. It has:

- The ability to mobilize and make available quality technical expertise to develop policies and strategies, particularly in climate mitigation and adaptation, social sectors, governance and environmental management and risk disasters;
- Knowledge and ability to take into account the rights and basic needs of the most vulnerable segments of the population;

- The ability of partner, mobilize and empower the communities and individuals to identify and own their problems and come up with pragmatic solutions;
- The focus on capacity building in all areas of support; and,
- Confidence among populations and national and international partners.

UNDP has also developed and implemented in Sierra Leone, aside from peace building in such a post-war country, many projects related to Environment, such:

- Development of Sierra Leone’s Second National Communication to the UNFCCC
- Capacity Building for Sustainable Land Management in Sierra Leone
- Environmental Cooperation for Peace Building (Capacity Building to the Sierra Leone Meteorological Department)
- Preventive Development (Disaster Management Project)
- Terminal Phase-Out Management Plan
- Halon Awareness Raising and Refrigerant Management project (on chemicals)

The project implementation capacity of the UNDP Sierra Leone Country Office’s (CO) environment team has been strengthened and expanded during the past years with the recruitment of new staff members. The Environment team now has 2 staff: a technical advisor and a portfolio manager. Moreover, UNDP Sierra Leone Country Office has good experience and capacities in implementing GEF-funded projects. The CO will also be technically backed up by the UNDP/GEF regional coordination team in Dakar comprised with 2 Regional Technical Advisors, and the UNDP/PREP team comprised with 3 Program Managers.

**C.1. INDICATE THE CO-FINANCING AMOUNT THE GEF AGENCY IS BRINGING TO THE PROJECT:**

UNDP contribution to the project will be US\$ 3,000,000: US\$ 200,000 as grant cofinancing and US\$ 2,800,000 as cash/in kind co-financing. In the cash/in kind co-financing, \$800,000 is from UNDP programs and \$2,000,000 from UNDP PREP regional program. The cash co-financing will be for project management. The remaining cofinancing is for activities in components 1, 2 and 3.

**C.2. HOW DOES THE PROJECT FIT INTO THE GEF AGENCY’S PROGRAM (REFLECTED IN DOCUMENTS SUCH AS UNDAF, CAS, ETC.) AND STAFF CAPACITY IN THE COUNTRY TO FOLLOW UP PROJECT IMPLEMENTATION:**

The proposal is in line with the UNDP Country Programme Action Program, CPAP 2011-2012 aligned with strategic priorities developed under the Joint Vision of the United Nations’ Family (UN JVP, 2009 – 2012). In particular, the scope of the project is aligned with five UN Joint Vision Programmes (JVPs) implemented by UNDP, particularly: Environmental Cooperation for Peace building (JVP 21). This initiative aims to establish a multi donor’s trust fund, and joint efforts on Energy access.

<b>CPAP statements regarding UNDP and environment (2011-2012)</b>	
Disaster Risk Reduction (DRR)	UNDP will support the Government’s efforts towards enhancing institutional and community capacities for DRR and management as well as sustained environmental management. Recognizing the acute environmental challenges the country is faced, UNDP will also build on existing capacity and ongoing programmes to address issues of biodiversity, sustainable land management, renewable energy and conservation. It will ensure that DRR is integrated into general planning processes. As deforestation greatly exacerbates the negative impacts of climate change, UNDP will also promote the link between climate change and DRR.
Climate Change	UNDP will support the GoSL in preparing the Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) and to present the information therein in a consistent, transparent and comparable as well as flexible manner, taking into account

	specific national circumstances. The project will also aim to continue raising awareness and knowledge of the population on climate change related issues in Sierra Leone and to strengthen the ability of the country to participate in different mechanisms aimed at curbing Greenhouse Gas emissions from its territory and to fulfill other commitments to the UNFCCC.
Sustainable Land Management (SLM)	UNDP will build capacity for SLM in Sierra Leone through the removal of the key barriers to SLM and through the greater mainstreaming of SLM into laws, university and school curricula, and the national budget. This project will also support the creation of sustainable capacity and ownership in Sierra Leone to mitigate land degradation and thereby meet the country's obligations under the United Nations Convention to Combat Desertification.
Partnership Strategy	The partnership strategy will take into account the following existing international agreements as well as national and international strategic frameworks and practices: (i) the Agenda for Change (PRSP II); (ii) the United Nations Joint Vision 2019-2012 (iii) the Paris Declaration on Aid Effectiveness; (iv) South-South Cooperation; (v) common funding mechanisms such as HIV/AIDS Global Fund, GEF, and Montreal Protocol

UNDP core Projects under the Joint Vision (2011-2012)			
	JVP	Project Title	Alignment with the scope of the project
UNDP as a Lead Agency	<b>JVP 2: Access to Justice and Human Rights</b>	Gender Equality and Women's Empowerment	Necessary support will be provided to ensure greater involvement of women in project.
	<b>JVP 11: Public Sector Reform</b>	Public Sector Reform	Outcome 1: effective implementation of government priority programming and coordination across Ministries, Departments and Agencies.
	<b>JVP 15: Democratic Institutions</b>	Development of an Independent Broadcasting Service	High quality programmes to inform actors on CC impacts and opportunities (outcome 1) and disseminate projects good practices
	<b>JVP 16: Local Governance and Decentralization</b>	Local Governance and Decentralization	Outcome 2: fit within the capacity development of local government in financial management and planning
UNDP as a Co-Lead Agency	<b>JVP 21: Environmental Cooperation for Peace building</b>	Support to the Meteorological Directorate  Climate Change Disaster Risk Reduction	Outcome 1: Provide consistent, transparent and comparable information on climate changes as well as flexible manner, taking into account specific national circumstances. Raising awareness and knowledge of the population on climate change related issues in Sierra Leone and to strengthen the ability of the country to participate in different mechanisms aimed at curbing Greenhouse Gas emissions from its territory and to fulfill other commitments to the UNFCCC. Outcome 2: Enhancement of institutional and community capacities for DRR and management as well as sustained environmental management. It will ensure that DRR is integrated into general planning processes and also promote the link between climate change and DRR.


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

#### **A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):**

NAME	POSITION	MINISTRY	DATE (MM/dd/yyyy)
Mr. Kolleh Bangura	Executive Director EPA-SL / GEF Operational Focal Point	Environment Protection Agency - Sierra Leone / Ministry of Energy & Water Resources	02/24/2012

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

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

<b>Agency Coordinator</b>	<b>Signature</b>	<b>DATE</b> <i>(mm/dd/yyyy)</i>	<b>Project Contact Person</b>	<b>Telephone</b>	<b>Email Address</b>
Mr. Stephen Gold UNDP/ GEF Officer-in-Charge		August 3 <sup>rd</sup> , 2012	Saliou Toure Portfolio Manager Energy, Infrastructure, Transport and Technology (EITT)	+221 33 869 07 89	<a href="mailto:saliou.toure@undp.org">saliou.toure@undp.org</a>

## Annex: CO2 Emission Reduction Calculations

<b>IMPROVED COOK STOVES</b>						
Parameter	Year					
	1	2	3	4	5	6
Number of improved cook stoves disseminated (units)	500	2500	6000	6000		
Total number of improved cook stoves in use (units)	500	3000	9000	15000	12500	6500
Total reduction of CO2 equivalent per improved cook stove (in Tons)	0	4500	13500	22500	18750	9750
Lifetime of the improved cook stove (ICS), years						<b>3</b>
CO2 emission reduction of per ICS, tons/year <sup>15</sup>						<b>1.4</b>
Total CO2 emission reduction from the ICSs, tons						<b>64,400</b>

### SUSTAINABLE CHARCOAL PRODUCTION

Type of Charcoal Kilns	Number of Units Installed	Annual Production, tons	Useful Life, Years	Total Lifetime Production	No. of Replacements
Traditional Kiln	1000	7	3	21,000	4
Adams Retort	1000	24	15	360,000	0
Casamance Kiln	0	9.6	5	0	2

<b>NOTES:</b>	<b>Charcoal to Wood Ratio</b>	<b>Useful Life, years</b>
Traditional Kilns	0.208	3
Adams Retort	0.385	15
Casamance Kiln	0.25	5

	CO2 Emission Reduction, tons			Charcoal Prod'n and Opt'n Losses, tons	Net CO2 Emission Reductions, tons
	Pyrolytic CH4 avoidance	Use of non-renewable biomass	Total		
Traditional Kiln	0	0	0	0	0
Adams Retort	1,260,000	1,332,000	2,592,000	129,600	2,462,400
Casamance Kiln	0	0	0	0	0
	<b>1,260,000</b>	<b>1,332,000</b>	<b>2,592,000</b>	<b>129,600</b>	<b>2,462,400</b>

<sup>15</sup> The average ICS charcoal consumption is 200 Kg per year, compare to 400 Kg per year for traditional cook stove. Traditional kilns charcoal to wood ratio is 0.208. So Annual wood saving is 200/0.208 = 962 Kg. Using an Emission factor of 1.462, it results to 1.4 tons/y (1.462\*962kg=1.406 ton, rounded to 1.4)

- Traditional Kilns have a minimum charcoal yield of 250 kg from about 1,200 kgs wood.
- Adams Retorts have an average yield of 250 kg of charcoal from 650 kg of wood (dry basis)
- Casamance Kilns have an average yield of 200 kg of charcoal from 800kg of wood (dry basis)
- Average annual production from Adam Retorts is 24 tons of charcoal; for Casamance it is 9.6 tons of charcoal
- Optimized charcoal production from use of Adam Retorts can entirely avoid the emissions of CH<sub>4</sub> from pyrolytic gases resulting from traditional processes. Avoiding CH<sub>4</sub> emissions through such a technology represents an emission reduction of roughly 3.5 tCO<sub>2</sub>e per tons of charcoal produced.
- Based on data from a leading study, with a conservative estimate of the percentage carbon content in wood, the CO<sub>2</sub> reduction conversion factor savings from avoiding the use of non-renewable biomass represents an emission reduction of roughly 3.7 tCO<sub>2</sub>e per ton of charcoal produced<sup>16</sup>.
- Total losses (i.e., production facility, charcoal transport, and distribution to consumers) do not exceed 5 percent.

Total CO<sub>2</sub> emission reduced: 64,400 + 2,462,400 = **2,526,800 tons**

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<sup>16</sup> Bailis, Modeling climate change mitigation from alternative methods of charcoal production in Kenya, 2009