REQUEST FOR CEO ENDORSEMENT

PROJECT TYPE: FULL-SIZED PROJECT

TYPE OF TRUST FUND: THE GEF TRUST FUND

PART I: PROJECT INFORMATION

Project Title: Promotion of sustainable biomass based electricity generation in Benin			
Country:	Benin	GEF Project ID:	5752
GEF Agency:	UNDP	GEF Agency Project ID:	5115
Other Executing Partner(s):	Ministry of Energy and Water; Ministry of Environment; Ministry of Agriculture, Société Béninoise d'Energie Electrique (SBEE); Communes of Kalalé, Djougou, Savalou, and Dassa.	Submission Date: Resubmission Date: Resubmission Date:	6 November 2015 10 February 2016 4 May 2016
GEF Focal Area(s)	Multifocal Area	Project Duration (Months)	60 months
Name of Parent Program (if applicable): • For SFM/REDD		Project Agency Fee ($):	367,897

A. INDICATIVE FOCAL AREA STATEGY FRAMEWORK

Focal Area Objectives	Trust Fund	Indicative Grant Amount ($)	Indicative Co-financing ($)
CCM-3: Renewable Energy: Promote investment in renewable energy technologies	GEF TF	1,959,132	12,750,000
LD-3: Reduce pressures on natural resources from competing land uses in the wider landscape	GEF TF	1,000,228	7,000,000
SFM-1: Reduce pressures on forest resources and generate sustainable flows of forest ecosystem services	GEF TF	913,242	6,000,000
Total Project Cost		3,872,602	25,750,000

B. INDICATIVE PROJECT FRAMEWORK.

Project Objective: To introduce an integrated energy and ecosystems-based approach to sustainable biomass electricity generation in Benin.						
Project Component	**Grant Type[1]**	**Expected Outcomes**	**Expected Outputs**	**Trust Fund**	**Indicative Grant Amount ($)**	**Indicative Co-financing ($)**
1. Policy, institutional, legal and regulatory framework for biomass electricity generation established.	TA	Streamlined and comprehensive market-oriented energy policy and legal/regulatory framework for biomass electricity generation by Independent Power Producers (IPPs).	1.1 Appropriate policy and legal/regulatory framework established and operational for *(a) Biomass electricity generation.* *(b) Establishment and implementation of a mechanism for re-investment of partial energy proceeds into community lands conservation.* 1.2 Technical report on grid capacity requirements to enable feed-in for grid-connected renewable energy systems followed by development of an updated grid code; as well provision for isolated mini-grid options. 1.3 Established procedures and standardized PPAs for the introduction of a transparent procurement process in the selection/award of biomass-based electricity supply agreements by private developers/IPPs. 1.4 One-stop shop for issuance of construction licenses and permits to private RE developers. 1.5 Methodology developed for a joint environmental, economic and financial evaluation of biomass plants in line with government regulations and policies. 1.6 Capacity developed within SBEE, local banks and key national actors such as Ministries of Energy, Agriculture and Finance to appraise renewable biomass[2] projects for PPAs and lending.	GEF	$270,000 (CCM) Total= **$270,000**	2,500,000

[1] TA includes capacity building, and research and development.

[2] Renewable Biomass is here referred as biomass originating from agricultural and forestry residues, which is the focus of this project. Renewable biomass from forestry plantations and non-renewable biomass, obtained from tree cutting and active deforestation, are not the subject of consideration under this project.

2) Promotion of investment in biomass-based electricity generation through appropriate catalytic financial incentives available for project investors.	TA & INV	Increased investment in clean energy technologies and low-carbon practices in the agro-forestry waste sector.	2.1 Financial Support Mechanism (Renewable Energy Guarantee Scheme) established and capitalized to support private investment in biomass plants. 2.2 MOU signed with the Central Bank setting out the objective, funding mechanism, administration rules and confirmation of their participation as fiduciary agent of the Financial Support Mechanism (FSM). 2.3 Financial and other incentives to be provided to project developers/Independent Power Producers (IPPs). 2.4 Documents supporting financial closure (Power Purchase Agreements, where applicable) with identified investors. 2.5 Reports confirming completion of construction of at least 4 MW of on-/off-grid biomass-based electric plants by IPPs at various sites by end of project.	GEF	200,000 (TA) 1,500,000 (INV) Total= **$1,700,000** (CCM)	12,000,000
3) Sustainable land use and forest management and implementation at the commune level.	TA & INV	Integrated land use, sustainable forest management and natural resource management over 14,000 ha provide social benefits and sustain biomass for electricity production.	3.1 Integrated Land Uses Management Plans (ILUMPs) are adopted in the four communes and strengthened the local institutional framework. 3.2 Fire management practices are operational over 3,000 ha in the Classified Forests in the neighbour of the biomass plants. 3.3 Woodlots are established over 2,000 ha in order to provide sustainable biomass and incomes. 3.4 New methods and techniques of agro-ecology (conservation farming practices) are implemented over 9,000 ha and reduce lands degradation and increase lands productivity (agricultural harvests and residues).	GEF	500,000 (TA) + 370,000 (INV) = $870,000 (LD) 500,000 (TA) + 300,000 (INV) = $800,000 (SFM) Total= **$1,670,000**	10,000,000
4) Outreach and results dissemination programme aimed at sustaining a growing market for	TA	Outreach programme and dissemination of project experience/best practices/lesso ns learned for replication	4.1 National Plan to implement outreach/promotional activities targeting domestic (and international) investors. 4.2 Capacity development of concerned Ministries / Institutions to monitor and document project experience.		15,000 (CCM) 30,000 (LD) 15,000	500,000

biomass gasifiers.		throughout the region.	4.3 Published materials (including video) and informational meetings with stakeholders on project experience/best practices and lessons learned.		(SFM) Total= **$60,000**	
Subtotal					3,700,000	25,000,000
Project Management Cost (PMC)[3]				GEF	172,602	750,000
Total Project Cost					3,872,602	25,750,000

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-financer	Type of Co-financing	Amount ($)
National Government	MERPMEDER through PAPDFGC (EU funded project)	In kind	**1,000,000**
		Cash	**3,500,000**
National Government	MERPMEDER through PAGEFCOM (AfDB funded project)	In kind	**1,000,000**
		Cash	**4,000,000**
National Government	ANADER	In kind	**250,000**
		Cash	**500,000**
National Power Utility	CEB (Electricity Community of Benin)	Equity	**15,000,000**
GEF Agency	UNDP	Grant/Cash	**500,000**
Total Co-financing			**25,750,000**

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)[2]	Total ($) c=a+b
UNDP	GEF TF	Climate Change*	Benin	1,959,132	186,117	2,145,249
UNDP	GEF TF	Land Degradation	Benin	1,000,228	95,022	1,095,250
UNDP	GEF TF	SFM	Benin	913,242	86,758	1,000,000
Total Grant Resources				3,872,602	367,897	4,240,499

E. DOES THE PROJECT INCLUDE A "NON-GRANT" INSTRUMENT? yes ☐ no ☒

PART II: PROJECT JUSTIFICATION:

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

1. As formulated, the PIF did not include a Component related to outreach and dissemination of project experience/lessons learned for in-country replication, as well as in and outside the region. The PPG launch

[3] To be calculated as percent of subtotal.

workshop held in Benin in September 2014 recommended that is was necessary to include it; hence, the RCE has now included a new component which is labelled Component No. 4: Outreach and results dissemination programme aimed at sustaining a growing market for biomass gasifiers. This outcome is especially relevant as it will make information on best practices/lessons learned available both in-country and to several countries within and outside the region - those that have substantial unutilised agricultural residues that could be utilised in gasifiers to provide their rural population with access to modern energy services.

2. The PIF envisaged 4 Components, with Component 2 dealing with the promotion of investment in biomass-based electricity generation through the provision of catalytic incentives and Component 3 supporting the establishment of a 1 MW biomass plant for electricity generation. During implementation of the PPG, the view was expressed that it would be rational and appropriate to have incentives go hand in hand with actual investment. Hence, these two Components were combined into one, as Component 2, to deal with both investment promotion and establishment of not one 1 MW plant but 4 biomass gasifier plants with a total capacity of 4 MW.

3. The proposed Renewable Energy Guarantee Scheme (REGS) in the PIF has been re-named "Financial Support Mechanism" (FSM) as it makes it clearer that its objective is to support investment in agricultural biomass gasifiers for electricity generation in cases when private investors supply biomass gasifier-generated electricity to the SBEE main grid or one of its isolated mini-grids. Should SBEE default on its payment to the developers, the FSM kicks in as a "risk minimisation fund" to compensate them for electricity already supplied.

4. In addition, Article 25 of the Electricity Law 2006-16 of 27 March 2007 allows the private sector to build its own isolated mini-grid and supply electricity that it produces to consumers, thus operating as a small utility without having to resort to selling electricity to SBEE. In such cases, the project will consider supporting private investors in sharing the costs for the preparation of feasibility studies and business plans and, eventually, providing an upfront investment grant, with a view to jumpstarting the market, for construction of the generating plant and distribution system. In this particular case, regular project funds will be utilised and will constitute grant funds designed to reduce the developers' transaction costs and make it easier for them to access debt financing from lending institutions.

5. The PIF envisaged development of a standardised baseline for renewable energy-based electricity generation, leading to reduced carbon finance transaction costs under the Voluntary Carbon Market mechanism. When the PIF was formulated a year ago, the carbon market was doing pretty well, enabling developing countries to capitalise on additional financial resources to advance their development agenda. However, the carbon market has since then almost "crashed", given the lack of demand for both voluntary and certified emission reduction units. Therefore, it does not make much economic and financial sense to focus on this issue at the present time. If, however, the carbon market happens to recover during implementation of the project, this issue will be re-visited under UNDP's adaptive management procedures and all efforts will be made to tap into it in order to access additional resources that the Government could use to expand development activities in the biomass gasification sector.

6. The PIF proposed to implement SLFM activities only for the Borgou Department (Commune of Kalalé). During the PPG, the target communes were expanded to include Djougou, Savalou and Dassa (see Prodoc for a detailed description). During the participatory process of the prioritization exercise, the government and the other stakeholders expressed the need to implement SLFM activities on the ground also for the 3 others pilot sites identified. Activities of the component 3 (SLFM) are now oriented for results on the ground to reach 9,000 ha of land under sustainable agriculture practices and 3,000 ha of forest sustainably managed in the 4 pilot sites selected. Reforestation activities have been reinforced to reach 2,000 ha. Hence, the project targets now a total of 14,000 ha of SLFM.

A.1 NATIONAL STRATEGIES AND PLANS:

1. Situation Analysis

With an area of 114,763 km^2 and a population of almost 10 million inhabitants (May 2013), the Republic of Benin (Capital: Porto-Novo) is a located in West Africa bordering Togo to the west, Nigeria to the east and Burkina Faso

and Niger to the north, where the Niger River, one of the largest in Africa, forms a 120-kilometre-long border between the two countries. Agriculture employs 70% of the active population and its contribution to the GDP amounts to 32% (World Bank, 2012) – per capita GDP was $ 872 (2014 estimate, IMF). A majority of the population live on its southern 125-km wide equatorial coastline on the Bight of Benin, which forms part of the Gulf of Guinea in the northernmost tropical portion of the Atlantic Ocean. The population is estimated at being 70% rural and 30% urban, with more than half being concentrated in the south. Although the coastline measures only 121 km, the country extends a distance of 650 km from the Niger River in the north to its southern coastline and is about 325 km at its widest point. The country is divided into twelve departments which, in turn, are subdivided into 77 communes.

Very little of the country's subsistence agriculture is mechanized and irrigation is only slightly developed. The industrial sector as a whole remains under-developed, contributing only to about 13% of GDP in 2013, mainly with textile and cement industries. GDP per capita was estimated as $ 756 per person in 2012 (Source: World Bank). Projections show that Benin will continue to be dependent on subsistence agriculture, cotton production, (they both produce a huge amount of "renewable biomass" in terms of agricultural or crop residues that can be utilised for energy purposes) and small-scale regional trade.

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 5 -17.

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

This project has been designed with the express intention of responding to GEF's overall strategic vision under GEF-5 of helping countries meet their sustainable development needs and achieve multiple environmental benefits through an integrated approach.

For a detailed description, please refer to the UNDP Prodoc, Section 2 "Project rationale and policy conformity", page 38 and "Country ownership: country eligibility and country drivenness", pages 43.

A.3 THE GEF AGENCY'S COMPARATIVE ADVANTAGE:

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

For a detailed description, please refer to "Section B.3: The GEF's Agency comparative advantage for implementing this project" of the PIF, page 23.

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

Some 75% of the population of Benin presently do not have access to electricity services; as an example, in 2008, only 27.1% of households in the country had access to electricity against a target of 33.7% established under the Millennium Development Goals. Over the next ten years, the grid in Benin will likely expand and more of the population will have access to electricity, albeit with frequent power cuts. Still, the national target for rural electrification of 36% by 2015 and 65% by 2025 is unlikely to be met - in 2008, the actual figure was 2.5% against a target of 6.6%. And where rural electrification is being undertaken, it is through expansion of the national grid or construction of diesel-based isolated mini-grids, rather than focus on renewable energy for electricity generation. At the present time, the share of renewable energy in the country's electricity generation mix is less than 5%, consisting mainly of a small amount of hydropower and some small industrial units generating their own electricity from the burning of biomass residues such as cotton and palm husks. In the near term, the future development of renewable energy in Benin for grid-connected solutions appears quite bleak for the simple reason that the Government has other

more pressing priorities with the limited resources it has at its disposal; hence, its willingness to create opportunities for the private sector in electricity generation.

The northern part of the country has an abundance of agricultural biomass that is left unutilised after the crops have been harvested. To utilise these "waste" biomass resources, UEMOA commissioned a feasibility study in 2008 for the installation of a gasifier to operate either a 250 kVA or a 400 kVA generator to supply a mini-grid in Bouka in the department of Kalalé in the north-eastern part of the country. For the 250 kVA case, the installation cost was computed at $ 3,600/kVA, while it was going to be $ 3,250/kVA for the 400 kVA case. With a 15-year gasifier life, operation during 7,000 hours/year (a Capacity Utilisation Factor (CUF) of 80%) and a payback period of 10 years, the sale price of electricity to the SBEE grid was computed to be US Cents 20.3/kWh. For comparison purposes, the average SBEE generation cost for diesel-based isolated mini-grids is 40 US Cents/kWh, to which should be added the cost of transmission and/or distribution, as appropriate.

For a detailed description of the baseline project and the problem that it seeks to address, please refer to the UNDP Prodoc, Sections 1.4 "Baseline Situation and Problem to be addressed" to Section 1.6 "Barriers to gasification technology for electricity generation in Benin", pages 17 – 34.

The Economics of utilising Gasifiers for Rural Electrification

At the present time, the biomass market in Benin is essentially dominated by non-renewable biomass, where active deforestation takes place as a result of charcoal production and direct fuelwood utilisation for cooking. Farmers barely take advantage of their crop residues which abound in quantity, mostly leaving them unused in the fields. However, as it is scattered randomly with low energy density, it is difficult to deal with centrally on a large scale. Hence, small-scale gasification-based power generation is an attractive resource for meeting the need for electricity services in rural areas, as demonstrated in Brazil, Burundi, China, India, Indonesia, Philippines, etc. In addition, it can address poverty issues in the rural areas through the creation of income-generating activities related to fuel collection, transport, commercialisation to the gasifier units and the eventual productive use of the electricity generated.

For a more detailed description of the "The Economics of utilising Gasifiers for Rural Electrification", please refer to UNDP Prodoc Section 1.7, pages 34 – 35.

Financial Support Mechanism (FSM)

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 that 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 unfamiliarity with the technology being proposed. In the case of Benin, the upfront investment cost related to a new technology (biomass gasification) for electricity generation can prove to be a major barrier faced by private investors in their efforts to secure credit funding from lending institutions. The second major barrier is the setting of an appropriate tariff, allowing financial viability of the system, but also taking into account the capacity to pay in rural areas. Hence, in order to assist in jump-starting the market and making the business of electricity generation through agricultural biomass-fired gasifiers attractive to private investors, the project considered the options of either a Loan Guarantee Fund (LGF) or a direct Financial Support Mechanism (FSM).

For a more detailed description of the "Financial Support Mechanism", please refer to UNDP Prodoc, Section 2 "Strategy", pages 38 – 43.

Project Components

The Ministry of Energy is the central body responsible for, among others, the design, formulation, and implementation of the Government's policy regarding development, supply and utilisation of energy at the national level. As such, it is entrusted with the responsibility of putting in place policy, plans and programmes that govern the promotion and rational utilisation of energy resources, development of renewable sources of energy and to participate in the

promotion of energy sources respectful of the environment. To achieve this, it relies on its Directorate for Energy and can count on the support of other Government Ministries and Department, including the Ministry of the Environment.

This project aims to pioneer a functioning and effective market for the widespread use and commercialisation of agricultural biomass gasifiers in Benin via four interrelated components: 1) development of an appropriate policy, institutional, legal and regulatory framework; 2) a business-friendly climate providing crucial catalytic incentives to promote investment in biomass-based electricity generation; 3) sustainable land and forest management at the commune level; and 4) increased capacity/awareness of stakeholders and private sector investors to adopt agricultural biomass gasification for electricity generation to capitalise on the economic and environmental benefits that it provides. It will focus on agricultural biomass-based gasification technology development and utilisation to substitute for forestry-based biomass and imported fuel used by the majority of Beninese households for domestic or business use. This is proposed to be achieved through the participation of the private sector at both electricity generation level and, in some cases, at the electricity distribution and sale level, as well. This programme will not only benefit household consumers and businesses, but will also connect financial institutions, technical training and local/women organisations to promote the establishment of an agricultural residue supply chain (Fig. 4) to develop the biomass gasification market.

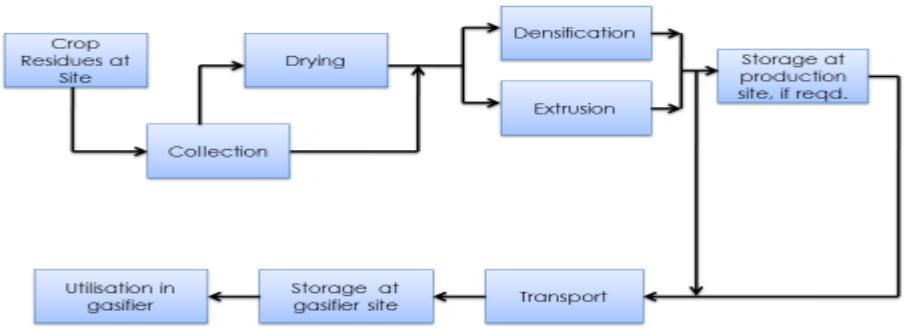


Fig. 4: Crop Residue to Gasifier Biomass Supply Chain

Source: World Bank, 2009.

For a more detailed description of "Project Components", please refer to UNDP Prodoc Section "Project objective, outcomes and outputs/activities", pages 45 – 55.

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 and unutilised renewable agricultural residue potential available in the country for electricity generation. This is expected to create a conducive environment for the private sector to invest in electricity generation through utilisation of biomass gasification technology to either supply the main grid or isolated mini-grids for meeting the needs of rural consumers for electricity services.

By project completion, some 76,651 MWh would have been generated and an annual generation of 24,498 MWh would be sustained over an expected 15-year projected life of the gasifiers installed under the project. All the electricity obtained from this biomass gasifier generation, if not implemented, would have otherwise been obtained from thermal power stations burning of imported diesel fuel. In doing so, the combined direct (340,399 t CO_2) and indirect (1,287,720 t CO_2) global benefits of the project have been assessed at almost 1.63 million tCO_2 for only the CCM-3 component.

Including the associated sustainable forest and land management the project, an additional direct 50,951 tCO_2 will be

avoided every year: 3,600 tCO_2 for classified forest management, 29,351 tCO_2 for trees plantation (output 3.3) and 18,000 tCO_2 for conservation agriculture. Thus during the 15-year lifetime of the biomass gasifiers, a total of 1,094,253 tCO_2 will be avoided as direct global benefit.

For a detailed description of the Incremental/Additional cost reasoning, please refer to the UNDP Prodoc Section 1.6 on "Barriers to biomass gasification technology for electricity generation in Benin", pages 31 -34 and Section on "GHG Reduction", pages 60 -62.

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).

The project presents some risks which are discussed in the Table below:

Risks	Rating (Probability of Occurrence)	Impact/Mitigation Approach
Policy and Regulatory: Reluctance in some quarters of the Government to introduce the necessary supporting policies and regulations.	Moderate	If this risk were to materialise, it would seriously affect project implementation. However, this is very unlikely the first sentence says it, as the Government of Benin is strongly motivated to provide access to modernised energy services to the large rural and peri-urban population that utilises fuel wood/charcoal for cooking and is driven by its plans to reduce the massive deforestation that accompanies the use of forestry resources. Hence, it will ensure that all Government Institutions (Ministries/Departments/Directorates, etc.) get on board to put in place a conducive policy and an enabling regulatory framework for biomass gasifier promotion and development. This will also be in line with its December 2003 "Energy Policy and Strategy" and the updated October 2009 "Strategic Plan for Energy Sector Development".
Economic/Financial: Non-availability of credit to promoters of biomass gasifiers.	Moderate	The project will work with local lending institutions to develop their capacity to understand and appraise gasifier projects for lending. In addition, the Financial Support Mechanism will contribute towards minimising risk exposure on the part of lenders.
Financial: Poor investment climate.	Moderate	The fact that Benin ranks 135 out of 189 economies on protecting investors and 169 out of 189 on enforcing contracts, as per the WB/IFC "Doing Business 2015" publication, provides insights into the difficulties that project developers may face. With this in mind, the project will put in place a Financial Support Mechanism that will be directed at minimising the financial risks that both project developers and lenders may face in doing business targeting biomass gasifiers.
Technology: Likelihood of gasifiers of inappropriate design and/or of poor quality introduced in the country.	Moderate	In order to avoid technology pitfalls, the project will establish network arrangements with other countries that have several years of experience with biomass gasifiers, like Brazil, Cambodia, China, India, etc. This will ensure that only successful models of gasifiers will be introduced and mistakes made elsewhere are not repeated. In addition, the project will bring in trainers from these countries to train Beninese technical personnel in high-quality installation, operation and maintenance of gasifiers.
Strategy: Village level commitment to change and adopt new agricultural methods is	Moderate	Project success will depend in very large part on changes in people's behaviour in rural villages. It is necessary to demonstrate the effectiveness (social, financial and environmental) of alternatives in the short and long-term to convince people to change long-held habits. Most rural villages operate at

not sufficient for the widespread adoption.		extreme levels of poverty and people may be unwilling to try new approaches when their basic livelihood needs are not being met. Participatory planning and decision-making processes as well as capacity building and organizational support will mitigate the risk of certain stakeholders restraining from participating in project implementation at least temporarily. Besides, pedagogic plots, trainings and visits to experimental farms are key activities to promote changes in rural areas.
Political: Land conflict and conflict among traditional / religious groups	Moderate	In order to avoid land ownership and use conflicts (in particular in the sacred forests), the project will be implemented through participatory processes, consensus building and conflict resolution and capacity building, with the underlying agenda of pre-empting conflict that could otherwise undermine project success. It will also work in close relationship with the GEF-UNDP Project entitled "Incorporation of Sacred Forests into the Protected Areas System of Benin" which generates useful results. Moreover, the recently adopted land tenure law reduces significantly the potential land conflicts as it improves the Rural Land tenure Plan, recognizing the customary rights ("Rural certificate").
Environmental/ Climate Change.	High	There are multiple environmental risks (e.g. decrease in the availability of agricultural biomass due to land degradation, reduced rainfall/water flows, drying up of watershed areas due to a change in climatic conditions) that can negatively affect agricultural output and result in a reduction in crop residues, thus negatively impacting on the biomass supply chain. This risk will be mitigated by introducing appropriate water management techniques in agricultural production, like drip irrigation and boreholes.
Overall	Moderate	

A.7 COORDINATION WITH OTHER RELEVANT GEF-FINANCED INITIATIVES

For a detailed description under this Section, please refer to UNDP Prodoc Section "Coordination with other relevant GEF-financed initiatives", pages 62 – 64.

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, Petroleum, Mineral and Water Resources, and Renewable Energy Development (referred to as Ministry of Energy, in short form). The Ministry will also have responsibility for implementing the companion UNDP-GEF Adaptation Project entitled "Strengthening the resilience of the energy sector in Benin to the impacts of climate change – NAPA Energy". For this, the Ministry will appoint a National Project Director who will assume overall responsibility for the implementation of both projects, 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) and supported by 2 Deputy Project Managers, one each for the Adaptation and Mitigation (Energy) projects. 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. A non-resident Technical Adviser (26 weeks/year) will be recruited to support the PM on technical issues, while a full-time Project Assistant (PA) will support him/her on administrative and financial matters.
Activities of the component 3 (SLFM) will be implemented by the General Directorate of Forests and Natural Resources (Ministry of Environment). A convention will be signed at the inception of the project implementation.

For additional information on "Stakeholder Participation", please refer to UNDP Prodoc, Section "Management Arrangements", pages 76 – 77.

B.2 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 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, wood and charcoal, 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.
- A rural development dynamism would be generated as farmers will now have a market for their "waste" agricultural residues, thus generating an additional source of income.
- Opportunities for the private sector in job creation for gasifier installation, operation and maintenance. The project will work with local training institutions (e.g. Ecole Polytechnique d'Abomey Calavi, Institut Universitaire de Technologie, Université Africaine de Technologie et de Management, Lycée Technique Coullibaly, Lycée Technique Kpondehou, Lycée Technique de Porto Novo, etc.) to develop 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.
- Paricipation of civil society, through the involvement of NGOs, including women NGOs**,** and stakeholder consultations, in the decision-making process related to biomass gasifier development, and for information and awareness raising activities.
- 500 jobs will be created in the gasifier/SFM/LD sub-sectors and 5,000 households will benefit from clean, modern electricity services.

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

As indicated in the Prodoc under para. 1 "Situation Analysis", SBEE (Benin Electricity Power Corporation) purchases power in bulk from CEB (Benin Electricity Community) at 10 US Cents/kWh. However, since 2006, CEB has been unable to supply the agreed amount of electricity to SBEE due to the energy crisis and this has resulted in SBEE operating its own costly gas turbines to generate electricity (e.g. at 69 US Cents/kWh in 2014 at Mariagleta) to supply the main grid. In addition, there are several villages that are not connected to the main grid and are served by isolated mini-grids that burn imported diesel fuel to generate electricity at the high cost of 40 US Cents/kWh, and that too for normally only 6 hours per day.

Introduction of biomass gasifiers for electricity generation to replace these isolated diesel generators can bring down the cost of generation to US Cents 20.3/kWh, as per a UEMOA feasibility study. This demonstrates the cost-effectiveness of generating electricity from biomass gasifiers in the off-grid areas of the country, compared to the alternative of utilising imported diesel fuel for that purpose.

It can be argued that that utilisation of solar and wind energy to generate electricity in these isolated mini-grids (very limited hydro sites are available in these remote villages) in lieu of biomass-fired gasifiers could provide a lower per unit emission abatement cost. However, Benin does not yet have any experience with grid-electricity generation from solar or wind in replacement of diesel fuel, although some proposals are in the works; hence, it is very difficult to determine generation costs in real-life situations, unlike the case of gasifiers where one installation at Songhai has been operating since 2012 and has provided valuable operational technical as well as economic/financial data.

During the 15-year lifetime of the biomass gasifiers, a total of 1,094,253 tCO_2 will be avoided, which means an investment of $ 3.50 of GEF funds per tCO_2. When the momentum generated by the project is factored in, resulting in the installation of additional gasifiers, an estimated 1,287,720 tons of CO_2 will be avoided in terms of both direct and indirect post-project emissions, and this translates into an abatement cost of $ 2.40/tCO_2 of GEF funds.

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$ *Excluding project team staff time*	Time frame
Inception Workshop and Report	▪ Project Manager ▪ UNDP CO, UNDP GEF	Indicative cost: 15,000	Within first two months of project start up
Measurement of Means of Verification of project results.	▪ UNDP GEF RTA/Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members.	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.	▪ Oversight by Project Manager ▪ Project team	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	▪ Project Manager and team ▪ UNDP CO ▪ UNDP RTA ▪ UNDP EEG	None	Annually
Periodic status/ progress reports	▪ Project Manager and team	None	Quarterly
Mid-term Review	▪ Project Manager and team ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost: 40,000	At the mid-point of project implementation.
Terminal Evaluation	▪ Project Manager and team, ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost : 45,000	At least three months before the end of project implementation
Project Terminal Report	▪ Project Manager and team ▪ UNDP CO ▪ local consultant	0	At least three months before the end of the project
Audit	▪ UNDP CO ▪ Project Manager and team	Indicative cost per year: $ 3,000 (Total: $ 15,000)	Yearly
Visits to field sites	▪ UNDP CO ▪ UNDP RCU (as appropriate) ▪ Government representatives	For GEF supported projects, paid from IA fees and operational budget	Yearly
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses		US$ 115,000	

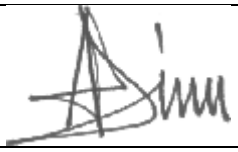
PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT AND GEF AGENCY

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

NAME	**POSITION**	**MINISTRY**	**DATE (**mm/dd/yyyy**)**
Mr Delphin **AIDJI**	GEF Operational Focal Point and Secretary General of Ministry of Environment, Housing and Urban Development	**MINISTRY OF ENVIRONMENT, HOUSING, AND URBAN DEVELOPMENT**	**MARCH 5, 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		May 4, 2016	Saliou Toure Regional Technical Advisor, EITT	+251 912 503 320	saliou.toure@undp.org

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 Target(s)	Sources of Verification
To introduce an integrated energy and ecosystems-based approach to sustainable biomass electricity generation in the country.	Emission reduction over the 15-year lifetime of gasifiers. Biomass-based electricity generation by project end.	Biomass-based electricity generation of 76,651 MWh by project end. Direct reduction of 67,070 tons of CO_2 over the 5-year FSP project life cycle. Subsequent generation of 24,498 MWh/year and reduction of 340,399 tons of CO_2 over the 15-year lifetime of the plants. Cumulative indirect GHG emission reduction of almost 1.3 million tons of CO_2 by 2035.	Project's annual reports, GHG monitoring and verification reports. Project final evaluation report.
	Integrated Land Uses Management Plans (ILUMPs) adopted.	At least 4 ILUMPs for project sites have been successfully developed, adopted (endorsed) by communes and under implementation.	
	Emission reduction due to SLFM.	Direct reduction of 659 030 tCO_2 due to implementation of SLFM activities.	
	Number of ha under SLFM practices.	At least 9,000 ha are under SALM practices.	
	Over 5,000 rural households and small commercial/industrial enterprises connected to electricity services by project end.	At least 200 jobs created for technicians to install, operate and maintain gasifiers and 300 permanent jobs for other operations.	
	500 jobs created in the gasifier/SFM/LD sub-sectors.		
Outcome 1: Streamlined and comprehensive market-oriented energy policy and legal/regulatory framework for biomass electricity generation by Independent Power Producers (IPPs).	Existence of adequate policy and regulatory framework.	Completed within 12 months of project initiation and approved by Government early in Year 2.	Published documents. Government decrees/laws.
Outcome 2: Increased investment in clean energy technologies and	Investment in biomass gasifiers in $$.	Completed within 12 months of project initiation and applied by Government thereafter.	Project documentation.

low-carbon practices in the agro-forestry waste sector.		$ 15 million invested in clean energy projects by project end.	Project reports.
Outcome 3: Integrated land use, sustainable forest management and natural resource management provide social benefits and sustain biomass for electricity production.	a. Carbon stock enhanced in the forests. b. Number of ha under SALM practices. c. CO2 sequestration with trees plantation.	a. At least an enhancement of 72,000 tCO_2 during the 20-year lifetime. b. At least 9,000 ha are under SALM practices. c. At least 587,030 tCO_2 sequestered during the 20-year lifetime.	Project's yearly reports. Project site visits and evaluation for verification Monitoring scheme.
Outcome 4: Outreach programme and dissemination of project experience/best practices/lessons learned for replication throughout the country/region.	Awareness about biomass gasifiers and their possibilities.	Increased awareness among some 30 stakeholders in place to monitor, promote and develop the market for biomass-based electricity generation.	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)

RESPONSES TO COUNCIL RECOMMENDATIONS

Comment	Response	Reference
Germany's Comments *Germany approves the following PIF in the work program but asks that the following comments are taken into account:* The development of new (biomass) power plants should not result in additional pressures on ecosystems, in particular forest resources, or have a negative impact on the provision of ecosystem services in the Three River area. Otherwise, mitigation measures should be taken.	As demonstrated in the table 5 of the Prodoc (page 50), the crop residues available for electricity generation at each of the pilot sites by far exceeds the biomass need for the proposed installed power plants. Besides, the gasifiers implemented during the project will be supplied only by agricultural residues. Hence, no additional pressures on ecosystems will come from the installation of the power plants. Moreover, the project develops an integrated approach with a SLFM component. While the biomass power plants will be installed, the project will support the land uses planning in the four communes, the protection of the surrounding forests through fire management practices, the plantation of woodlots, and the dissemination of sustainable agricultural practices. These activities will have positive impacts on forests and on ecosystems services.	ProDoc, page 50
France's Comments Overall, we are not convinced by the phasing of this project. Components 1 and 3 of the project aim respectively at working on the institutional framework and setting a first pilot unit, and constitute a first project. Working on component 2 (establishment of financial tools for the implementation of other units) assumes that we have already solved the previous two (1 and 3). As for the 4th component (land use and forest management), it is clearly out of the project's scope. In other words, initiate component 1 without techno-economic feedback from component 3 may prove risky. Indeed, in the absence of lessons learnt from a project in operation (and thus a market of agricultural residues), who can say what will be the actual cost of electricity?	As explained under "Changes in project alignment" above, the PIF envisaged 4 Components, with Component 2 dealing with the promotion of investment in biomass-based electricity generation through the provision of catalytic incentives and Component 3 supporting the establishment of a 1 MW biomass plant for electricity generation. During implementation of the PPG, the view was expressed that it would be rational and appropriate to have incentives go hand in hand with actual investment. Hence, these two Components were combined into one, as Component 2, to deal with both investment promotion and establishment of not one 1 MW plant but 4 biomass gasifier plants with a total capacity of 4 MW. Component 3 now deals with sustainable land use and forest management, while Component 4 discusses outreach and dissemination. Policy, and legal/regulatory framework for biomass electricity generation are dealt with under Component 1. In addition, each "Component" represents only a grouping of activities and, as such, it does not necessarily imply that activities under, for example, Component 1 need to be completed first and the results fed into implementation of the subsequent Component(s). In fact, all four Components will can and will be implemented in parallel, except for Component 4 "Outreach and results dissemination" which will be somewhat out of "synchronism", for obvious reasons). The project develops an integrated approach at the commune level in order to address sustainable	CEO ER, pages 4-5

	energy, sustainable agriculture and forest management in a comprehensive and most effective manner that include both the supply and demand sides of the biomass feedstock. As biomass power plants will operate with agricultural residues, it makes sense to promote sustainable agricultural practices (increase of agricultural productivity and thus of biomass availability) and to reduce pressure on the surrounding forests.	
In details: • It may be preferable to start a pilot installation without private investment (but with private management) in order to identify the barriers which will appear, whether regarding raw material supply, connection to an electricity network with pop-up and multiple cuts (when there is a cut on a network, those producing are not paid throughout this cut), or human resources challenges to manage and maintain such a facility in such an isolated city (about 100 km from asphalt road, except if new roads have been recently built).	• As described in the Prodoc, a 40 kVA (32 kW) gasifier has been successfully operating at the Songhai Centre (an NGO established in 1985) in Porto Novo since 2012. The funding for this gasifier was raised as a grant raised by a Dominican priest, but it has always operated under a private management business model. As such, it can already be considered as constituting a "pilot" that has been operating for the last 4 years in Benin and that provides exactly the kind of information that this comment seeks to elicit. The lessons learned from Songhai will be very useful for the private sector when planning to embark in electricity generation from the gasification of agricultural residues.	ProDoc, pages 17-18 and pages 35-36
• Availability and management of raw material. The project seems based, technology-wise, on the gasification of cotton stalks (but it is not clear whether the project gives priority to this agricultural residue or not). Apart from a mention in a study conducted by UEMOA in 2008 (unavailable on the internet), availability at the ginning factory of this resource is nowhere mentioned. Although there is of course cotton in this territory of Benin, there is no practice of collecting and centralizing cotton stalks (the logistics of the cotton seeds is already difficult...). Such a project would involve setting up a chain of these stalks, which suggests studying the schedule of collection, storage issues, pricing and back on the fields as (directly or indirectly) of the value in terms of fertilization of these stalks that are usually burned in the field;	• The project does not focus exclusively on the use of cotton stalks. In fact, the gasifiers will utilise agricultural residues in general from crops such as maize, sorghum, millet, rice and cotton. The total availability of agricultural residues and the volume that can be available for gasifier electricity generation were evaluated during the PPG and the results are presented in Table 3a: Availability of Agricultural Residues, 2008 – 2013. Data gathered and analysed during the PPG show that some 45% of the huge amount of agricultural (crop) residues produced remain unused, after allocation is made for utilisation as fuel for cooking and allowed to rot to "strengthen" the soil as fertiliser. This so-called "nuisance" biomass is discarded through open-air combustion in the fields, but can be an important source of income to farmers if they can be sold to operators of biomass gasifiers. The project will address the issue of setting up an appropriate mechanism to establish the price for the agricultural residues that will provide a win-win situation to both the farmers in terms of collection and sale of agricultural residues to the gasifier owners and to the latter in ensuring a regular, uninterrupted and sufficient feedstock supply chain so as not to disrupt their electricity generation activities.	ProDoc, pages 20-21
• Indicators: as it is mentioned "avoided tCO2", the document does not provide information on the necessary quantity of agricultural residues, and their equivalent in hectares.	• As indicated in the preceding bullet point, the availability of agricultural residues is provided in Table 3a. The 4 MW installed during the project will required about 13,327 tons of residues per year,	

	which is equivalent to the quantity of agricultural residues produced on 20,000 ha of maize fields (with an average yield of 1.3 tons per ha for maize).	
• Human Resources competence and maintenance circuits: knowing that the selected municipality has not the easiest access to the Department, the question of the provision of a team of skilled technicians for maintenance or settings will be part of the delicate aspects for a private operator.	• The issue of capacity development is addressed by the project both in terms of training of biomass gasifier installers and operators / maintenance staff in the rural areas and safe utilisation of electricity by consumers. In addition, training will be provided to farmers to disseminate good practices around the biomass power plants.	
• Finally, central biomass technology is not, unlike solar or hydro, highly capital-intensive. The issue, in addition to be sure that the public actor will respect its contract, is the access to raw material with an interesting rate for both parties.	• The ProDoc has addressed the issues of biomass gasification technology, experience over a 4-year operation of a gasifier in the country, availability of agricultural biomass for electricity generation, the supply chain to minimise disruption in the feedstock chain and the opportunities for implementing MW-size gasifiers for electricity generation in Benin. On an average, and excluding the cost of the electricity distribution system, the capital investment for electricity generation through biomass gasification in developing countries is approx. $ 1,800/kW. After factoring in maintenance, lube oil, biomass fuel, etc., the cost of electricity generation varies, depending on the capacity utilisation factor (CUF) of the equipment. A Master's thesis prepared by a Beninese student in 2013 shows the following cost of generation for the Songhai 40 kVA installation located at Porto-Novo: 25% CUF: 43 US Cents/kWh; 50% CUF: 23 US Cents/kWh and 80% CUF: 16 US Cents/kWh. In other countries with extensive experience with gasifiers (Cambodia, China and India), a similar cost pattern is observed, although the actual costs/kWh are somewhat lower, showing a decrease in generation cost with an increase in CUF. In addition, the cost effectiveness section above shows the advantage of biomass compared to alternative RE systems in Benin. The proposed project intervention addresses the key barriers to biomass based power generation. The availability of and access to agricultural residues as feedstock for the gasifiers are described in the Prodoc and have been addressed above.	ProDoc, pages 35-36
❖ **Opinion*: A major revision of the PIF is required in order to address the above weaknesses.***	During implementation of the PPG, Project proponents took into consideration the very useful comments made by GEF Council Members and ensured that these were addressed in the formulation of the CEO ER and ProDoc. This has now been taken care of in these documents. There was no need for major revisions, but instead, to come up with additional details for some key issues (feedstocks, gasification techniques, etc.) raised in the comments.	

RESPONSES TO STAP RECOMMENDATIONS

Comment	Response	Reference
1. STAP welcomes this project which addresses electricity regulations and grid integration from bioenergy power plants and capacity building across a wide range of stakeholders. Financing of 4 MW capacity is planned and a 1MWe gasifier demonstration plant is to be established. Biomass forest feedstock are to be managed sustainably.	1. During the 5-year project period, a total of 4 MW of biomass gasifier electricity generators will be installed, as outlined in the PIF.	
2. With only a quarter of the population having access to electricity, either imported or from costly fuel oil plants at a very high USD 0.40/kWh generation cost, developing bioenergy plants will assist rural electrification. But deforestation has to be strictly controlled and must not be used to supply the biomass. The UNEP/GEF guidelines on Biofuels can provide useful guidance in this regard (even though they target liquid biofuels rather than solid biomass).	2. The project proposes to exclusively utilise agricultural biomass that is left over after other uses like soil strengthening, fuel for cooking, raw material for hedges, etc. Available data show that there is a subsequent excess of "nuisance" agricultural residues that annually get disposed of. No active "forestry" biomass will be utilised to power the gasifiers. Specific plantations will be established, if required, in the neighbourhood of the power plants for (i) sustainable biomass supply, (ii) restoration of degraded lands, and (iii) income generation for households. While the project does not target liquid biofuels, as suggested by STAP, it will refer to the UNEP/GEF guidelines on Biofuels for any relevant biomass-related issues and lessons learned that may be pertinent to the implementation of this project.	
3. The carbon balances from LD and SFM are complex and difficult to assess, but the use of residues avoiding deforestation and the encouragement of afforestation are major contributors.	3. The project will support both afforestation and forest conservation in the commune where power plants will be established. The plantation of 2,000 ha (500 ha per pilot site) will stock 29,351 tCO_2 per year. The improvement of SFM through development of wildfires practices will avoid the emission of 3,600 tCO_2 every year.	
4. Agricultural residues are proposed as a feedstock for bioenergy. There is apparently a large resource of residues from maize, with substantial amounts also from sorghum and cotton. To assess the sustainability of using these residues for bioenergy it is necessary to determine their current use. For example, if they are currently burned in the field, then their use for energy is not likely to have a detrimental effect on soil carbon levels or crop production. However if they are retained in the field as mulch, their removal could reduce yields due to loss of soil moisture and higher soil temperature, and increase risk of soil erosion. If they are gathered and used for fuel, then there is a potential leakage issue	4. Present usage of agricultural biomass has been assessed and there is ampler excess "nuisance" agricultural biomass for utilisation in the gasifiers.	

unless the proposed bioenergy plant will provide a suitable alternative energy product to those affected. Thus, it is important to determine the conventional use of the agricultural residues in order to assess and manage the likely impacts of residue removal.		
5. Sustainable land management encourages the retention of residues, to enhance soil properties and productivity and resilience of agricultural production, and minimise erosion and soil carbon losses. Thus it is important that a new demand for biomass for bioenergy does not jeopardise the implementation of sustainable land management. The quantity of residue that should be retained will depend on the soil type and landscape position (which determine erosion risk). Education on the benefits to production from SLM is more likely an effective strategy than regulation, to encourage sustainable use of agricultural residues for bioenergy.	5. The project will start with the development of integrated land uses at the commune level which integrate the demand of biomass for electricity generation. Then SLFM activities will enhance biomass production with (i) increase of crop productivity thanks to SALM practices implementation and (ii) reforestation of 2000 ha (500 ha per pilot sites).. The approach for dissemination of SLFM practices is based on a training approach to raise education on the opportunity to implement SLM for land conservation and additional income generation.	
6. Agricultural residues could provide useful biomass feedstock for the proposed 400 kWe gasifier if carefully managed. Low moisture content of biomass is essential for efficient gasification. The GEF project is to seek finance models for similar plants and to increase the capacity of this demonstration plant to 1 MW. Technically this is not easy, other than by adding multi-gasifiers in addition to the existing plant. It is not usually possible to retrofit an existing gasifier to increase its capacity. The challenges in operating and maintaining a gasifier should not be under-estimated and the experience from India in particular could be useful in this respect, though it is noted that experiences from other African countries are being sought.	6. The project will solicit expertise from countries like Brazil, Burundi, China, India, Indonesia, Philippines, etc. where there is a wealth of experience with gasifiers. In addition, the private sector investors will make their own decisions as to single- or multiple-unit biomass gasifiers they wish to install.	
7. The design, type and manufacturer of the gasifier is not described and seems has already been selected for the demonstration plant under construction. It is hoped due diligence was undertaken in this regard as plants vary widely in efficiency and reliability, particularly with respect to tar formation.	7. The project document describes the 2 types of common biomass gasifiers (updraft and downdraft) and explains the reasoning behind downdraft gasifiers being the preferred choice for electricity generation. Average cost figures of $ 1,800/kW are also provided. It also mentions those countries (Brazil, China, India, etc.) that have a long experience in utilising biomass gasifiers for electricity generation and where gasifiers are available for purchase. However, the project does not recommend from which manufacturer the gasifier should be purchased. While the project will support interested developers with technical/economic information on gasifiers, it will be exclusively the decision of the developer to select the gasification system it wishes to procure and install.	
8. Integrating the generation plant into an existing grid can be challenging as a gasifier output cannot be easily ramped up and down to meet ever-changing loads as can hydropower (i.e., it is non-dispatchable). It is therefore possibly easier to run	8. The gasifiers will run continuously as base-load plants, except for scheduled maintenance and repairs. For peak loads, either hydro or diesel generation will step in.	

it continually as base load or possibly for periods during the day to meet higher load demand. 9. Calculations suggest that avoided CO_2 from the bio-power plant assumes the power generated displaces a portion of the current thermal power plant output. However, with continuing growth in demand and expansion of rural electrification, this will be additional generation but it is a form of low-carbon generation so should be supported. 10. Overall, the project will need to develop an appropriate M&E framework to assess project performance against agreed targets. 11. In the PIF it is noted that 75% of Benin's population do not have access to electricity. In addition to biomass energy, mini and micro-hydro and PV could be important technologies to increase access to electricity. Project proponents are recommended to consider specific incentives supporting on-grid and, particularly, off-grid RETs beyond biomass. Such support could be appropriate for policy component 1.	9. This is correct. Where the SBEE grid is available, the gasifier-generated electricity will be connected to the grid. Where there is no grid, the gasifiers will operate in isolated-grid mode. 10. This will be undertaken and is described in the project document. 11. As indicated in the RCE, Benin's Second National Communication (June 2011) recommends the installation hydropower plants (147 MW), biomass plants (30 MW), solar plants (25 MW), and wind plants (10 MW) by 2030 in an effort to reverse the increasing trend in GHG emissions in the country. While this project focuses on biomass gasification for electricity generation, all the other renewable energy options for on/off-grid electricity generation are being pursued by the Government. However, except for large hydro, little has been achieved in terms of grid/mini-grid electricity generation from PV and wind machines, with the result that generation cost figures are not available.	

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:

Project Preparation Activities	***Implementation Status***	***GEF Amount ($)***				***Co-financing ($)***
		Amount Approved	***Amount Spent to date***	***Amount Committed***	***Uncommitted Amount****	
Collection and analysis of baseline data including comparative review of other countries under similar conditions and circumstances	Completed	40,000	40,000			30,000
Review of experiences in Benin and other countries of the following:	Completed	15,000	15,000			15,000

Project Preparation Activities	*Implementation Status*	*GEF Amount ($)*				*Co-financing ($)*
		Amount Approved	*Amount Spent to date*	*Amount Committed*	*Uncommitted Amount**	
- Application of biomass electricity generation - Land use and forestry - Area/community-based energy needs assessment and planning						
Conduct a Logical Framework Analysis (LFA) to define project goal, objectives, outcomes, outputs and activities, including success indicators as well as delineation of responsibilities and coordination mechanisms	Completed	15,000	15,000			10,000
Stakeholder engagement, capacity needs assessment of key local implementing partners and co-financing	Completed	20,000	20,000			10,000
Detailed design of project implementation plan	Completed	10,000	10,000			5,000
Preparation and finalization of the full-sized Project Document	Completed	0	0			10,000
Total		**100,000**	**100,000**			**80,000**

*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