Independent mid-term review

NIGERIA

Mini grid based renewable energy (biomass) sources to augment rural electrification

UNIDO project No.: GF/NIR/12/001
UNIDO SAP ID: 100260
GEF project ID: 3943

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna, 2015

Distr. GENERAL

ODG/EVA/15/R.5

September 2015

Original: ENGLISH

This mid-term review was managed by the responsible UNIDO project manager with quality control by the UNIDO Office for Independent Evaluation

This report has been prepared for UNIDO for the mid-term review of the UNIDO GEF project "Mini grid based renewable energy (biomass) sources to augment rural electrification" in Nigeria.

Project Manager: Thomas Jossy

Review team: Marjan Mihajlov, MSc, *Author*
Benjamin Aniakor, *Contributor*

ACKNOWLEDGEMENT

The Review Team would like to acknowledge the many and diverse contributions made to this review report. We are particularly thankful to staff of UNIDO at the Headquarters and in the field, to officers and staff from government agencies in Nigeria visited during the mission.

Contents

Abbreviations and acronyms

APPL	Abakaliki Power Plant Limited
BoI	Bank of Industry
ECN	Energy Commission of Nigeria
EPC	Engineering Procurement and Construction
EU	European Union
FiT	Feed in Tariff
FMEnv	Federal Ministry of Environment
FMP	Federal Ministry of Power
GDP	Gross Domestic Product
GEF	Global Environmental Fund
GHG	Greenhouse Gases
HQ	Head Quarters
M&E	Monitoring and Evaluation
NERC	Nigerian Electricity Regulatory Commission
NPD	National Project Director
PMU	Project Management Unit
PSC	Project Steering Committee
SMART	Specific, Measurable, Attainable, Relevant, Trackable
SC	Steering Committee
TA	Technical Assistance
UNIDO	United Nations Industrial Development Organisation

Glossary of evaluation-related terms

Term	Definition
Baseline	The situation, prior to an intervention, against which progress can be assessed.
Effect	Intended or unintended change due directly or indirectly to an intervention.
Effectiveness	The extent to which the development objectives of an intervention were or are expected to be achieved.
Efficiency	A measure of how economically inputs (through activities) are converted into outputs.
Impact	Positive and negative, intended and non-intended, directly and indirectly, long term effects produced by a development intervention.
Indicator	Quantitative or qualitative factors that provide a means to measure the changes caused by an intervention.
Intervention	An external action to assist a national effort to achieve specific development goals.
Lessons learned	Generalizations based on evaluation experiences that abstract from specific to broader circumstances.
Logframe (logical framework approach)	Management tool used to guide the planning, implementation and evaluation of an intervention. System based on MBO (management by objectives) also called RBM (results based management) principles.
Outcomes	The achieved or likely effects of an intervention's outputs.
Outputs	The products in terms of physical and human capacities that result from an intervention.
Relevance	The extent to which the objectives of an intervention are consistent with the requirements of the end-users, government and donor's policies.
Risks	Factors, normally outside the scope of an intervention, which may affect the achievement of an intervention's objectives.
Sustainability	The continuation of benefits from an intervention, after the development assistance has been completed.
Target groups	The specific individuals or organizations for whose benefit an intervention is undertaken.

Executive summary

This report summarizes the findings of the mid-term review (MTR) of the "Mini grid based renewable energy (biomass) sources to augment rural electrification" Project in Nigeria (herein referred to as "Project"), implemented by the United Nations Industrial Development Organization (UNIDO) with financing support provided by the Global Environment Facility (GEF).

The project is financed by GEF under GEF-4 Strategic Program "Promoting sustainable energy production from biomass", Parent program/umbrella project "GEF programmatic approach on access to energy in West Africa". It is implemented by UNIDO together with national executing partners: Federal Ministry of Energy, Energy Commission of Nigeria and Federal Ministry of Environment, Housing and Urban Development.

The mid-term review is conducted on a request of UNIDO by an external team of independent evaluators consisted of international expert Mr. Marjan Mihajlov and national expert Mr. Benjamin Aniakor.

The mid-term review covers the duration of the project from its starting date in December 2011 to the estimated mid-term review date November 2014, i.e May 2015. The MTR was conducted in the period of 01.05.2015 – 30.06.2015. It assesses project performance and progress against the evaluation criteria: relevance, effectiveness, efficiency, sustainability and impact.

The overall objective of the review is to provide information to the key question of the mid-term review - to what extent the project is achieving the expected results at the time of the mid-term review, i.e. to what extent the project has promoted renewable energy (biomass) based mini-grid as an alternative to diesel based energy generation systems in Nigeria.

Findings and recommendations

The key findings of this Mid Term Review are summarized upon evaluation criteria and recommendations and presented accordingly.

Key findings

Relevance. The Project is very consistent with the focal areas/operational program strategies of GEF and very relevant to the national development and environmental priorities and strategies of the Government and population of Nigeria, and regional and international agreements.

The Project has been identified as relevant at the time of its conception and preparation, considering the energy situation. Now, the Project is even more relevant having in mind the wide gap between energy supply and demand and the cost of energy in Nigeria.

Design. The Project has a very good design which is in line with the national developmental needs of the country considering the power shortfall and adequate to address the problems at hand. It has been based on the outcome of various studies and verifications conducted by both external and internal consultants. The preparatory process has been based on wide consultations and participatory approach involving

relevant national counterparts and beneficiaries participating in the identification of critical problem areas and the development of technical cooperation strategies.

The project has a very clear thematically focused development objective, formulated based on the logical framework approach which was found to be adequate but it may requires to be reviewed considering the delay in implementation over time.

Although the design is simple and fits the needs, it is not completely clear in terms of the outcomes and outputs as they seem to be mixed in some instances, and the targets and indicators do not look sufficiently precise as they are not SMART, again in some instances.

Effectiveness. At the time of the MTR, the Project seems to be partly satisfactory in the light of successful project implementation. All the activities of the first period but the demo project were implemented in a very satisfactory way. However, due to the circumstances explained further in the Report, there is significant delay on the commencement of the construction of the biomass power plant.

In terms of achievement of the outcomes and expected behavioural changes, it must be noticed that although the Project is somewhere in the middle and there is a delay on the demo project implementation, there are noticeable benefits. The awareness about the project and the expected results it seems to be higher, the stakeholders are more confident in the outcomes particularly now when the relevance of the Project is bigger.

Efficiency. All component activities foreseen to be implemented in the first period have been implemented within the expected time frame including all preparatory activities for the demo project, except for the construction activity itself.

Sustainability. There are no issues that may pose significant possible risk affecting the sustainability of the Project. In financial terms, considering the commitments expressed so far and the resources invested in the Project, it is not much likely that the change of the Government would pose risk on the financial commitments to the Project. However, it is necessary UNIDO to follow up on this issue and to get a reaffirmation on the position from the owner's side.

M&E. The project has a plan for M&E which includes the Project Results Framework, the annual work plans as well as detailed progress and activity reports. The plan also includes and budgets for a mid-term review and a final project evaluation.

The main concern is related with the M&E design and that is some indicators /targets are not reflective of the related outcomes and are not SMART in some instances.

Project management has been successfully carried out by the UNIDO Project Manager. On the side of the PMU, the absence on the position of national Project coordinator seems to affect on the coordination and information.

Key conclusions

UNIDO's Mini grid based renewable energy sources to augment rural electrification Project is an excellent and very important concept with a numerous benefits on different levels. The Project is very in line with country's national strategic plans on energy, environment and socio-economic level. The Project for sure will bring great

number of economic, institutional, social and environmental benefits on a local, regional and national level.

At this stage it is essential that all stakeholders give a good push within their roles and responsibilities. It is an opinion of the review team that there is no significant technical barrier that can stand on the way of the implementation once the first milestone payment is done by the owner of the Project.

However, there is room for improvement for each of the parties. UNIDO and the stakeholders need to make one good push on the implementation in order to overcome the most important obstacle – the first payment. Also, there is room for improvement in the management and coordination particularly having in mind that more important part of the project is yet to come in the second period.

Key recommendations

The recommendations are separated according to the designees into: recommendations to UNIDO and recommendations to Stakeholders.

UNIDO:

- A delegation from UNIDO headquarters and Country Office to visit the new Governor on fund release as soon as possible.

  This is a crucial stage of the Project and all major parties need to have a meeting to reaffirm their roles and agree to make a strong decisive push on the implementation. Having heard that all administrative barriers on the fund release are now eliminated, it is necessary that all stakeholders get a reaffirmation on the commitment from the owner of the Project and a concrete date for the fund release.

  The Bank of Industry, as major stakeholder in APPL, on their interview meeting with the review team confirmed their commitment and expressed readiness to participate on such meeting in order to consolidate the Project position on its implementation path. The meeting needs be organized and to happen as soon as possible. Thereupon, the SC should be informed appropriately.

- UNIDO should make a serious case for the extension of the project life for 2 to 3 years.

  In order to capture the positive situation that has been created for a long time during the implementation of the project activities, and due to the delays that happen, it is necessary that the implementation is given more time. The extension time should mainly include the time for construction of the plant which according to the Contract should be 18 months, but also the time necessary for capacity building.

- A National Project Coordinator should be immediately designated and domicile at the Electricity Commission of Nigeria (ECN).

  The Project Coordinator should act as a connection between the SC and the PMU. This means intensive coordination activities, regular updating of SC with the latest developments on the project implementation. PMU may consider preparation of monthly communication letter to the SC as an effective information dissemination tool.

- Objectives and performance Indicators need to be SMART (Specific, Measurable, Attainable, Relevant, Trackable), and should, where possible indicate expected number of outputs. Where possible, the framework or the work plans should be revised as to give enough information about the outputs and targets, according to the findings.

Stakeholders:

- Ebonyi State Government should make an immediate payment of the first installment, as according to the agreements, showing a strong commitment and paving the road to the other APPL stakeholders.
- All stakeholders need to show a strong commitment in regards to the Project implementation and act to their roles and responsibilities at a highest possible level.
- Outstanding payments and contributions by all stakeholders should be made in order to speed up implementation.
- APPL may consider contacting the engineering, procurement and construction (EPC) contractor to make sure there is no issues related to the Contract conditions in regards to the delay and possible review.

1. Review objective, methodology and process

On a request of UNIDO, an independent Mid Term Review was conducted on the "Mini grid based renewable energy (biomass) sources to augment rural electrification" Project in Nigeria. The MTR was conducted in the period of 01.05.2015 – 30.06.2015. The Review was conducted by an independent review team contracted by UNIDO, consisted of one international and one national expert.

The primary objectives of the review are to assure:

- Accountability - by reporting on UNIDO activities to the governing bodies of UNIDO, to partner governments, to donors that have (co-) financed the activity and to other stakeholders of UNIDO.
- Supports management – by providing recommendations to project manager, team leader, UNIDO management at all levels, as well as to UNIDO counterparts and donors.
- Drives learning and innovation – by drawing general lessons from specific cases and make those lessons available to all. The findings are used to improve the services of the Organization, to guide management decisions or evolve innovative approaches.

1.1 Scope and objective

The mid-term review covers the duration of the project from its starting date in December 2011 to the estimated mid-term review date November 2014, i.e May 2015. It assesses project performance and progress against the evaluation criteria: relevance, effectiveness, efficiency, sustainability and impact.

The overall objective of the review is to provide information to the key question of the mid-term review - to what extent the project is achieving the expected results at the time of the mid-term review, i.e. to what extent the project has promoted renewable energy (biomass) based mini-grid as an alternative to diesel based energy generation systems in Nigeria.

The review provides an analysis of the attainment of the main objective and specific objectives under the four core Project components. Through its assessments, this Report should enable the Government, counterparts, the GEF, UNIDO and other stakeholders and donors to:

(a) Verify prospects for development impact and sustainability, providing an analysis of the attainment of global environmental objectives, project objectives, delivery and completion of project outputs/activities, and outcomes/impacts based on indicators. The assessment includes re-examination of the relevance of the objectives and other elements of project design according to the project evaluation parameters.
(b) Enhance project relevance, effectiveness, efficiency and sustainability by proposing a set of recommendations with a view to ongoing and future activities until the end of project implementation.

1.2 Methodology

The mid-term review was conducted in accordance with the UNIDO Evaluation Policy and all relevant UNIDO and GEF guidelines and policies. It was carried out as an independent in-depth review using a participatory approach whereby all key parties associated with the project were informed and consulted throughout the review. While conducting the review, the review team leader liaised with the Project Manager on the conduct of the review and methodological issues.

The review team used different methods to ensure that data gathering and analysis deliver evidence-based qualitative and quantitative information, based on diverse sources: desk studies, literature review, individual interviews, direct observation, presentations and feedback review.

The methodology was based on the following:

- Desk review of project documents including:
  - The original project document, monitoring reports (such as progress UNIDO and GEF annual Project Implementation Review (PIR) reports), output reports (case studies, action plans, sub-regional strategies, etc.) and relevant correspondence.
  - Notes from the meetings of committees involved in the project (e.g. approval and steering committees).
- Other project-related material produced by the project.
- Interviews with various stakeholders
  All interviews were conducted in the form of one-to-one consultation based on previously developed interview plan and questionnaires.
    a. Interviews with project management and technical support including staff and management at UNIDO HQ and in the field and staff associated with the project's financial administration and procurement.

b. Interviews with project partners including Government counterparts, GEF focal points and partners that have been selected for co-financing as shown in the corresponding sections of the project documents.

- On-site observation of results achieved in demonstration projects, including interviews of actual and potential beneficiaries of improved technologies.
- Interviews with intended users for the project outputs and other stakeholders involved with this project.
- Interviews with the relevant UNIDO Country Office and the project's management and Project Steering Committee (PSC) members and the various national and sub-regional authorities dealing with project activities as necessary.
- Other interviews, surveys or document reviews.

Review work plan

The "Review Work Plan" included the following steps:

1. Desk review of project documentation,
2. Briefing with the project manager and discussing the methodology and project details. This was done in UNIDO HQ in Vienna, in the period of 14.05 – 15.05.2015. During this briefing, the team leader conducted additional interviews with UNIDO representatives related to the project.
3. Field mission in Nigeria. This was done in the period of 18.05 - 22.05.2015. During the mission, the review team had interviews with the UNIDO country representative, government and project stakeholders. Within this mission, the team visited the project location where the demonstration project is foreseen to take place and had interview with UNIDO State coordinator and stakeholders.
4. Presentation of preliminary findings. Because of the complex mission itinerary, this presentation was not conducted. Instead, the preliminary findings were sent for review to the project manager and project team in Nigeria.
5. Presentation of draft findings and recommendation. The presentation took place in UNIDO HQ on 30th of May, 2015. The main findings, conclusions and recommendations were presented and discussed with the project manager, evaluation representative and other relevant stakeholders at UNIDO Headquarters.

2. Country and project background

2.1 Country background

With a population of about 173 million people, Nigeria is the largest country in Africa and accounts for 47% of West Africa's population. It is also the biggest oil exporter in Africa, with the largest natural gas reserves in the continent. Given these large reserves of human and natural resources, the country has significant potential to build a prosperous economy characterized by rapid economic growth that can significantly reduce poverty, inequality and improve standards of living of the population through better access to and quality of health care, education and infrastructure services.

Political Environment

Nigeria’s population is made up of about 200 ethnic groups, 500 indigenous languages, and two major religions - Islam and Christianity. The largest ethnic groups are the Hausa-Fulani in the North, the Igbo in the Southeast, and the Yoruba in the Southwest. The fragmentation of Nigeria’s geographical, ethnic and cultural identity lines is effectively balanced by the country’s federal structure and the strong emphasis of the federal government on representing six geopolitical zones and different ethnic and cultural identities.

Nigeria’s socio-political environment is unstable mainly due to the al-Qaeda-aligned Boko Haram armed movement which is conducting an insurrection in the mainly Muslim north. Internationally, Nigeria continues to be a leading player in the African Union, the New Partnership for Africa’s Development (NEPAD), and in the Economic Community of West African States (ECOWAS).

The 2015 presidential election was first in Nigeria's history to be won by an opposition candidate. The new President H.E. Muhammadu Buhari won the 5th democratic election at the head of the All Progressives Congress. The 5th consecutive national elections further consolidated the transition from military to democratic rule that began in 1999. The elections signified substantial progress in electoral and democratic development, and were characterized by observers as freest and fairest in the country's election history.

Economic and social situation

With a population of 170 million people, Nigeria is the most populated country in Africa and accounts for 47% of West Africa’s population. It is also the biggest oil exporter in Africa, with the largest natural gas reserves in the continent. Oil accounts for close to 90% of exports and roughly 75% of consolidated budgetary revenues. With these large reserves of human and natural resources, the country is poised to build a prosperous economy, significantly reduce poverty, and provide health, education and infrastructure services to meet its population needs.

Throughout the last 10 years, Nigeria has been carrying an ambitious reform agenda. Nigeria was among the first countries to adopt and implement the Extractive Industries Transparency Initiative (EITI) to improve governance and oil sector. Prudent macroeconomic policy has finally brought inflation down to single digit levels. Structural reforms in power and agriculture appear to be paying at least some dividends, even if their main potential impact of these measures will be in the longer term. Growth continued to be broad based, oriented primarily toward the domestic market, and driven by strong performance of the agricultural, trade, telecommunications, and manufacturing sectors. However, strong economic growth has not translated into higher employment rates. Employment remains the major issue with an estimated 50 million underemployed youth.

Despite a strong economic track record, poverty is significant, and reducing it will require strong non-oil growth and a focus on human development. Constraints have been identified to enhancing growth, including the investment climate; infrastructure, incentives and policies affecting agricultural productivity; and quality and relevance of tertiary education. In spite of successful initiatives in human development, Nigeria may not be on track for meeting most of the Millennium Development Goals (MDGs).

Vision 2020 is an articulation of the long-term intent to launch Nigeria onto a path of sustained social and economic progress and accelerate the emergence of a truly prosperous and united Nigeria. In recognition of the enormous human and natural endowments of the nation, the long term plan is to improve the living standards of Nigerians and place the country among the league of 20 largest economies in the world with a minimum GDP of $900 billion and a per capita income of not less than $4000 per annum. The target for year 2020 was based on a dynamic comparative analysis of the country's potential growth rate and economic structure vis-à-vis those of other Top 40 economies in the world. This implies that the Nigerian economy must grow at an average of 13.5% from 2010 to 2020. Agricultural and industrial sectors are expected to drive the growth at the earlier stage while service sector will take over at the latter stage.

In line with the Vision 20:2020 the Government of Nigeria started implementing a Transformation Agenda. The Transformation Agenda itself is focused on three key areas which include strong, inclusive and non-inflationary growth; employment generation and poverty alleviation and value re-orientation of the citizenry. Targeting thirteen key sectors, the strategy aims at bringing about the most needed structural changes to consolidate the Nigerian economy and foster resilience and sustainability.

2.2 Project background

Nigeria is blessed with an abundant supply of energy resources. These include reserves of crude oil and natural gas, coal and renewable energy sources such as hydro, biomass, solar and wind energy. Despite heavy investment in the electricity sector, the country is currently faced with acute electricity problems which are hindering its development. With a total installed electricity generation capacity of about 6,000MW, and actual generation of 2,000MW to 4,000MW, the electricity demand in Nigeria far outstrips the supply (Nigeria Vision 2020).

In Nigeria, only 40% of the total population has access to electricity. The majority of the people who have access to electricity live in urban areas. But, more than 50% of the Nigerian population lives in rural areas. Only less than 20% of the rural households have access to electricity. The electricity that is being supplied is also unreliable and of inferior quality for the end users with frequent shutdowns and grid failures.

Most of the industries are not connected to national grid thereby resulting in 100% dependency on diesel generators or diesel drives for their energy needs. The electricity generation cost becomes high when diesel generators are used. The industries that are already connected to the Government electricity distribution lines receive electricity only for few hours a day. Hence, these industries also depend on their own backup diesel generators for their electricity needs. Due to diesel usage, the electricity cost for industries are very high resulting in increased production cost affecting their competitiveness. This limits the growth of the industries and hinders the overall development of the country. Moreover, the usage of diesel also generates considerable amount of GHG emissions.

Presently, the total installed capacity of the currently generating plants in Nigeria is 10,390 MW with available capacity less than 6,056 MW, with power generation bellow 4,500 MW and electricity demand over and above 15,000 MW. There is a large gap

existing between the demand and supply of electricity. A part of this large gap is being met out by electricity generated using individual diesel generating sets installed by capable industrial and commercial sectors and also by few households. The supply and demand gap in the electricity sector is growing day by day and the public utility is unable to keep up with the increasing demand. The statistics show that in the next two decades, Nigeria's population is likely double.

The tariff for the Nigerian electricity market is one of the lowest tariffs in the world. With increasing costs, the current tariff level has not been sufficient to meet the operating or capital investment costs of the unbundled companies along with the gas supply payment and the IPP payments. Other major reasons for this deficiency are, high technical loss levels and low collection efficiencies. These two factors together, account for almost 50% of the potential revenue loss. As a result, there is a yearly revenue gap, which has been historically met by the Government through ad hoc transfers.

The Power Holding Company of Nigeria (PHCN), the national electricity utility, is unable to extend the grid to all areas of the country due to resource constraints. The electricity sector in Nigeria has been constrained by many other factors such as generation deficit, weak transmission and distribution infrastructure, poor utility performance, over dependence on fossil resource and neglected investment for a long period of time.

On other side, the country is endowed with lot of biomass energy resources which are not being utilized for the right purpose. The country's biomass energy resources have been estimated to be 83 million tonnes of crop residues / year and 61 million tonnes of animal waste / year. At present in most of the agro industries, these wastes are either dumped or burnt.

The agricultural wastes and wood wastes generated in several parts of Nigeria are either dumped or burnt, without being used for any energy or non-energy purposes. This results in significant environmental hazards and health problems due to methane and other harmful emissions. Alternatively, large amount of electricity can be generated if these biomass and animal waste residues are used for power generation.

In 2004, Nigeria's energy consumption mix was dominated by fossil fuels namely the oil (58 %) and the natural gas (34 %). Renewable resources, primarily in the form of hydroelectricity, contributed to 8 % only. This situation if continued could lead to significant increase in the country's GHG emissions. Therefore, it is important to use the country's renewable energy resources instead of the fossil fuels. This is particularly the case in rural electrification schemes, where, the potential of locally available biomass energy resources can be tapped.

Electricity generation from the biomass will also result in global environmental benefit in the form of CO_2 emission reduction by replacing fossil fuel based power generation. The Nigerian Government has put forth many policies, legal and regulatory frameworks for promoting renewable energy based electricity generation in Nigeria. Some of such important policies are:

- The National Energy Policy (NEP 2003)
- The Electricity Power Sector Reform Act (EPSR 2005)
- The REA and the Rural Electrification Fund (REF 2006)

- Nigerian Renewable Electricity Policy (NREP 2006)
- Renewable Energy Master Plan (REMP 2007)

Though there are several policies and regulatory frameworks formulated for promoting the renewable energy based electricity generation, there is no growth in the biomass based power generation in Nigeria. It is mainly due to the several barriers that hinder the development of biomass power generation.

Table 1 Project fact sheet

General Information	**Project Title**	**SPWA-CC: Mini-Grid Based on Renewable Energy (Biomass) Sources to Augment Rural Electrification**
	GEF ID	**3943**
	UNIDO ID (SAP Grant Number)	**200000281**
	Region	**AFR**
	Country(ies)	**Federal Republic of Nigeria**
	GEF Focal Area(s)	**Climate Change**
	GEF Agencies (Implementing Agency)	**N.A**
	Project Executing Partners	**Federal Ministry of Power, Energy Commission of Nigeria, and Federal Ministry of Environment**
	Project Size (FSP, MSP, EA)	**FSP**
Milestone Dates	**Project CEO Endorsement/Approval Date**	**27 December 2011**
	Project Implementation Start Date (PAD Issuance Date)	**07 August 2012**
	Original Expected Implementation End Date (indicated in CEO Endorsement/Approval document)	**31 October 2015**
	Revised Expected Implementation End Date (if any)	**31 October 2017**
Funding	**GEF Grant (USD)**	**2,621,800**
	GEF PPG (USD) (if any)	**60,000**
	Total GEF Grant Disbursements as of 30 June 2015 (USD) Total Expenditures = Commitments + Payments)	**820,586**
	Co-financing (USD) at CEO Endorsement	**11,935,000**
	Total Project Cost (USD) (GEF Grant + Co-financing at CEO Endorsement)	**28,171,000**

The Project consists of four technical components.

Table 2. Project components

Component	Outcome
1. Development of techno-economic feasibility studies and business plans for identified potential sites to facilitate replication.	Preparatory works completed for facilitating replication in the identified potential sites
2. Demonstration of techno-economic viability of biomass based mini-grid.	Acceptance by stakeholders on the technical and financial viability of selected site for setting up of biomass based mini grid for rural electrification.
3. Strengthening of financial and policy environment to support RE based mini-grid systems.	Conducive financing and policy environment for promoting investments in rural mini-grids in place.
4. Capacity development for replication of RE mini-grid technologies.	Capacity of local planners, institutions and experts for RE based mini-grid enhanced.

Project component 1 – Development of techno-economic feasibility studies and business plans for identified potential sites to facilitate replication

Project Component 1 (PC1) aims at conducting techno-economic feasibility studies, development of business plans for the identified potential sites for facilitating replication and other necessary activities for the development of the feasibility study power plants. Based on the available information from the site visit and studies conducted during the PPG stage, the following sites were identified for full feasibility study and for further development:

a) 5 MW wood waste power plant in Ondo State

b) 2 MW wood waste power plant in Ogun State and

c) 2 MW rice husk power plant in Benue State

Under this component, the project works with the State Governments, National and International experts and will deliver the following output:

1. Techno-economic feasibility studies and business plans developed for the 3 identified potential sites to facilitate replication.

Techno-economic feasibility studies and business plans developed for the 3 identified potential sites to facilitate replication A report on list of agro-processing industries, production capacity, annual production data of the industries, etc., will be prepared. After that, detailed techno-economic feasibility studies will be conducted by international biomass experts in all the sites mentioned above. Appropriate business plan for further development of these sites will also be formulated. The techno-economic feasibility study will also include a study on historical biomass generation at these sites in order to ensure the sustainable operation of the power plants throughout their life time. In order to get the accurate assessment of biomass availability, the daily, weekly, monthly and yearly operating patterns of the related industrial activities

including the operational variations during different seasons such as rainy, dry, peak, off-peak, etc., will be thoroughly studied. The biomass supply assessment will be done for the entire year, with a special focus on supply during rainy seasons, when the industrial processing activities are expected to be minimal. Activities related to planning and preparation of the mini-grid establishment on these feasibility study sites including, an assessment of the electricity demand for all the nearby electricity consumers and their current electricity sources will be done in order to determine the possibility of selling the electricity to them. The study will also include an assessment on establishing the mini-grid.

Information on the potential investors for the power plant projects will also be collected. Based on all the above assessments, a business plan will be developed for the investment, financing, construction and operation of the project. These business plans will be used to attract project developers and investors to replicate the projects. In addition, identification of licensing and permits required, processing procedures and time required for these 3 sites will be carried out by national experts. Similarly, compilation of BoI privileges and any other privileges along with the existing tax schemes applicable for the biomass project feasibility study sites will be carried out by the national experts. National experts will be engaged for the compilation of environmental regulation from relevant departments, processing time, procedures, etc. for these sites.

Project component 2 - Demonstration of techno-economic viability of biomass based mini-grid

Project Component 2 (PC2) aims in commissioning a biomass based mini-grid of 5 MW installed capacity that will replace diesel power generation and thereby contributing to the reduction of around 25,000 t CO2 emission per year. As the project is new to Nigeria sufficient capacity development in operation and maintenance (O&M) of biomass power plant as well as the management of mini-grid will be provided. The biomass mini-grid project will be monitored for its performance and the result will be widely disseminated. All the stakeholders are expected to gain considerable knowledge and experience and are expected to replicate such projects elsewhere in Nigeria.

During the PPG stage, in addition to the 5 MW rice husk power plant, potential sites for a 2 MW biomass power plant and two 0.5 MW Small Hydro Power (SHP) plants were identified for a total capacity of 3 MW and detailed studies were carried out. However, the 5 MW biomass project in Ebonyi State was brought up to an advanced stage, where the support and co-financing commitments by shareholders were finalised. The Government requested UNIDO to support further in this project, as it is in the advanced stage. Hence, the 5 MW biomass project was considered instead of the 2 MW biomass and 2 x 0.5 MW SHP projects.

Under this component, the project will work with the Ministry of Energy, Energy Commission, Federal Ministry of Housing, Environment and Urban Development, State Government, international experts, national experts, private sectors, financing institutions, equipment suppliers, engineering companies, etc. and will deliver the following output:

1. A biomass based power plant of 5 MW commissioned in the selected site along with mini-grid

2. Capacity on biomass power plant operation and maintenance as well as mini-grid management developed

3. The mini-grid independently monitored, evaluated, lessons learnt and information widely distributed

A biomass based power plant of 5 MW commissioned in the selected site along with mini-grid it aims to implement biomass based mini-grid in the selected site. The electricity produced will be distributed to the consumers through the mini-grid.

Detailed technical specification will be incorporated in the bid documents along with commercial conditions. Once the share holding patterns are finalized, bid document will be launched internationally for sourcing biomass power plant equipment. Once bidders submit their bids, they will be evaluated and shortlisted and the project will be awarded to the most competent and capable bidder based on the scoring mechanism set forth. After the contract is awarded to the bidder, the bidder is expected to implement the project based on the cost and time frame fixed in the bid document. An international expert will be hired to oversee the site construction activities. All necessary licenses, permits and contracts required for the construction and the operation of the power plant will be arranged before starting the construction of the plant. An international insurance expert will study the insurance regulations and practices in Nigeria and come-up with suitable recommendations on the insurance required for the construction and operation of the power plant.

Similarly, the tender document preparation, launching, tender evaluation, etc. will be done for the minigrid and mini-grid Installation Company will be selected. For mini-grid construction, grid interconnection with the power plant, metering distribution lines, provision of energy efficient meters for the consumers, etc., an amount of USD 450,000 will be borne by GEF. Without this contribution from GEF, the power plant will result in higher electricity sale price which will be difficult to find buyers.

Commissioning and other costs will be taken care by the Ebonyi State Government. The construction and commissioning activities will be supervised by the local experts. In the construction site, mini-grid owners (shareholders) will have a site office to manage the day-to-day activities during the construction and commissioning of the biomass based mini-grid and will have their own staff for this purpose. This team will work closely with the equipment supplier/EPC contractor and the construction companies in order to facilitate their works in the sites. UNIDO project management team, the international experts and the local experts will closely interact with the site office team and will assist and advise them in the implementation activities.

Since this is the first biomass power plant in Nigeria, there is not much experience in O&M of the plant. Hence the equipment supplier/EPC contractor will provide four overseas power plant operational experts for operating the power plant for a period of 1 year. These operational experts will train the local operators for the sustainable operation of the power plant throughout its lifetime. Once the project construction is over, performance tests will be conducted by the EPC contractor in the presence of the international expert.

GEF resources will be used for providing technical assistance for the development, installation and commissioning of the proposed biomass based mini-grid power plant and will not be used for any other equipment purchase other than mini-grid installation. Only the co-financing resources will be utilised for power plant equipment purchase

and installation activities. To be precise, the co-financing resources will be utilised for purchase of land and power plant construction and commissioning, and for a part of minigrid construction activities.

GEF resources will be used for the technical assistance of the activities such as, preparation and launching of bid documents for power plant and mini-grid, evaluation of bid, selection of equipment suppliers for power plant and mini-grid, detailed testing of soil, water and fuel, analysis of electricity customer profile, Obtaining licenses and permits, providing expert inspection and supervision during construction of power plant and mini-grid, arrangements for insurance and contracts, etc.

Capacity on biomass power plant O&M and mini-grid management developed

One of the major issues in Nigeria is the lack of manpower capacity in O&M of the biomass power plant and management of mini-grid. The project will identify the operators with adequate educational background and experience and then train them in O&M aspects of biomass power plant and management of mini-grid. Operators will be hired in two stages. In the first stage, around five operators will be hired and they will be given a two week classroom training on “Understanding biomass power plant, its construction and operation”. Power plant administration staff and other key stakeholders will also participate in the training activities.

After classroom training, around 10 operators will get hands-on-training in the existing boiler-turbine power plant systems within Nigeria. After getting reasonable training, suitable operators will be placed in the power plant and they will be trained by equipment suppliers during the construction, commissioning and test runs. They will be given on-the-job training and class room training. The contents of exact training will be finalized after discussion with the equipment suppliers. The operators will also assist the project owners in the day-today site activities in construction, commissioning and test run. In addition to this, training to the electricity distribution company on management of electricity distribution, metering and fee collection will be organised.

Independent monitoring and evaluation of mini-grid and distribution of the lessons learnt

After completion of the project, the project performance monitoring will be conducted to study the technical, financial, environmental and socio-economic performance of the projects. A monitoring report will be prepared based on the monitoring and analysis. Full scale project demonstration site visit and seminars will be organized and the project experiences will be disseminated to various interested stake holders in order to increase the replication potential of the project. Various dissemination tools such as leaflets, website, etc., will be used for effective dissemination.

Project component 3 – Strengthening of financial and policy environment to support RE based mini-grid systems.

Project Component 3 (PC3) aims to strengthen the financial and policy environment to support RE based mini-grid system. This will be done through close cooperation with Ministry of Energy, Energy Commission of Nigeria, Nigeria Electricity Regulatory Authority, CBN, BoI and local financing institutions. Recommendations on FiT for biomass power plant will also be made.

Under this component, the project will work with Federal Ministry of Energy, Federal Ministry of Housing, Environment and Urban Development, Energy Commission, CBN, BoI, State Governments, international experts, national experts, financing institutions and other commercial banks and will deliver the following output:

1. Feed-in-Tariff for biomass power in place.

2. Appropriate financing facility developed for RE related projects

Development of Feed in Tariff (FiT) for biomass power

One of the major policy and regulatory issue in Nigeria for the development of biomass based power generation is the lack of FiT scheme for renewable energy. FiT scheme already exists for large IPPs. But, when this power purchase tariff is applied for RE based power plants it is very low as the cost of power generation from biomass is much higher when compared to large scale IPPs such as natural gas based gas turbines/combined cycle power plants. Hence, in order to promote biomass based power generation, attractive FiT scheme is required. The project will engage national experts for compiling the various studies done so far in Nigeria related to FiT scheme to provide feedback to international experts for the creation of new, workable FiT scheme. International experts will be engaged to study, develop and recommend appropriate FiT for the Government. National experts will be engaged for liaising with relevant agencies for the creation of the Feed-in-tariff scheme. Consultative workshops will be conducted to get a feedback on the FiT scheme. All these activities shall aid in the development of FiT for biomass power in Nigeria.

Appropriate financing facility developed for RE related projects

At present the financial institutions lack knowledge and experience in financing the biomass energy projects. They also lack the knowledge to assess the biomass projects and related project risks. Moreover, good demonstration projects are not available in Nigeria for them to learn from. The project will conduct specific training programmes for financing institutions, so that they can understand and assess the project and related risks. These activities in addition to the demonstration project are expected to change the mindset of the financial institutions and they are likely to finance more and more for biomass energy projects.

During the project implementation stage, a financial scheme, specifically for the RE projects, similar to the one which was introduced in Nigeria recently for power projects (mostly from fossil fuel), called the Power Fund, will be developed. GEF and co-financing contributions will be used only for facilitating the financing scheme and not for establishing the facility. Hence, the actual capital investment for the scheme is expected to come from outside of the project resources.

The Power Fund scheme was introduced by Central Bank of Nigeria (CBN) on March, 2010. Under this scheme, CBN provided N 500 Billion investment facility towards the development of 2,000 MW power projects across major commercial and industrial cities in the country. The fund is being administered by the state-owned Bank of Industries (BoI), while the African Finance Corporation (AFC) serves as its adviser. The funds are given to BoI at 1% interest rate. BoI distributes the fund in the form of concessionary loan at a interest rate of not more than 7% with a tenor of 10 to 15 years. Already projects are identified and the implementations are going on.

National experts will be engaged for coordinating with various relevant departments to design appropriate financial mechanism along with international experts. In developing the proposed financing facility, during the project implementation, efforts will be taken in collaboration with Ministry of Energy, CBN, BoI and other commercial banks for creating a similar financial facility exclusively for RE related projects. This would add momentum to the RE investments which would in-turn augment rural electrification in the country. Efforts will be taken to disseminate the information on newly created RE power fund.

Similarly, efforts will be taken to consolidate various support schemes and to streamline the support schemes of various departments into a centralized well co-ordinated one.

Project component 4 – Capacity development for replication of biomass mini-grid technologies

Project Component 4 (PC4) will facilitate the capacity building on both human and institutional fronts at various levels including, engineers, energy service companies, O&M companies, etc. Various stakeholders of biomass power plant mini-grid system such as experts, planners, project developers, private investors, RE related and financial institutions, engineering companies and construction companies will be trained in biomass project development and implementation. Capacities of financial institutions will be developed for assessment and evaluation of biomass power plant projects to increase their knowledge and capacity on financing these projects. Local electrical companies will be trained in mini-grid design and the engineering companies will be trained in biomass power plant O&M aspects.

Under this component the project will work with the State Government, international experts, national experts, equipment suppliers, local engineering firms, O&M Companies, RE related and financial institutions and will deliver the following output:

1. Local capacity in designing mini-grid developed

2. Experts, planners, and institutions are trained in developing biomass based energy and mini-grid system

3. Capacity of RE related and financing institutions strengthened

4. Capacity of local engineering companies and O&M companies on operation and maintenance of biomass power plant and mini-grid system developed

Development of local capacity in designing mini-grid

At present there is a lack of knowledge and experience in designing mini-grid for the biomass projects. In order to remove this barrier, a training program will be specifically arranged for interested local electrical companies. They will be trained mainly on design of mini-grid, integration aspects of minigrid with biomass power plant including distribution lines, integration with consumers of electricity from biomass power plants, usage of step up/step down transformers, plant outage, fault levels, safety aspects, etc.

Training in developing biomass based energy and mini-grid systems to experts, planners and institutions Various stakeholders of biomass power plant mini-grid system such as experts, planners, project developers, private investors, financial institutions, engineering companies and construction companies will be trained in

biomass based mini-grid project development and implementation. Specific three day trainings will be organized in two different locations in Nigeria. In addition to that, biomass based mini-grid project development guide will be prepared for the usage of various stakeholders for implementation of biomass based mini-grids. Using co-financing resources, study tours will be organized for various government agencies to the demonstration project site for developing their capacities. Efforts will be taken to create a nationwide awareness on biomass power generation/renewable energy. Also, coordination workshops will be conducted for various departments to simplify licensing, permit procedures for Biomass/Renewable energy (RE) plants.

Under this output, it is planned to establish a one-stop information centre for renewable energy projects, especially biomass energy projects. The State Government will be responsible for this. A department level consultation meeting for the establishment of the information centre for RE projects will be organized. The location of such an information centre, modalities and procedures for establishment and operation of that centre, etc. will be decided during the inception period of the project by the State Government. Database/information to be kept at the information centre will be prepared by an international expert in assistance with national experts. At the information centre, trainings and workshops for relevant government staff on capacity development in Biomass/Renewable Energy technologies will be conducted periodically.

Also, co-ordination workshops among various departments to simplify licensing and permit procedures for Biomass/Renewable energy plants will be conducted.

Capacity of RE related and financing institutions strengthened

The project will identify few relevant renewable energy institutions in Nigeria and will provide necessary supports and adequate training for them on biomass project development in order to strengthen their capacities further; so that they will be able to assist development of similar biomass projects in the future in other places of Nigeria.

One of the major issues faced by Nigerian financing institutions is the lack of capacity in understanding, assessing and evaluating biomass projects for financing. As a result, whenever potential project developer/investors approach them for financing, they are hesitant to provide loan for the biomass projects. The project will remove this barrier by selecting several financing institutions and train them on understanding, assessing and evaluating biomass projects for financing.

After completion of the training, the knowledge of the financing institutions about the biomass mini-grid projects is expected to increase considerably and they are expected to consider biomass projects more favourably.

Development of capacity of local engineering companies and O&M companies on operation and maintenance of biomass power plant and mini-grid systems

A list of existing local engineering companies and O&M companies that are capable in operating and maintaining the biomass power plant, mini-grid systems and other renewable energy technologies will be compiled. Two or three local engineering companies and O&M companies will be identified and they will be trained by equipment suppliers during the construction, commissioning and test runs. They will be given on-the-job training and class room training. The contents of exact training will be finalized after discussion with the equipment suppliers. These engineering

companies and O&M companies will be engaged later on for the actual maintenance of the power plant.

Project implementation arrangements

UNIDO has the responsibility of implementing the project, the delivery of the planned outputs and the achievement of the expected outcomes. The project is executed by UNIDO in collaboration with the concerned Federal Ministries, State Governments and the private sector stakeholders.

UNIDO is responsible for:

- The general management and monitoring of the project,
- Reporting on the project performance to the GEF.
- Procuring the international expertise needed for delivering the planned outputs under the four project components.
- Managing, supervising and monitoring the work of the international teams and ensuring that the deliverables are technically sound and consistent with the project requirements.

A Project Management Unit (PMU) is established consisted of a Project Manager (PM) and the Project Administrative Assistant (PAA). The responsibilities of PMU are:

- Coordination of all project activities carried out by the national experts and other partners by having close association with the Ministry of Energy/State Governments.
- Day-to-day management, monitoring and evaluation of project activities as per planned project work.
- Organization of the various seminars and trainings to be carried out under Project Components 2, 3 and 4.

Throughout the period of project implementation, the PMU will receive the necessary management and monitoring support from UNIDO and the monetary support from GEF and counterparts. A Project Steering Committee (PSC) is established. The purpose of this committee is to review the progress in project implementation, to facilitate co-ordination among project shareholders and to maintain transparency in ensuring ownership and to support for the sustainability of the project. The PSC has a balanced representation from key stakeholders including counterpart Ministries, public institutions and private sector representatives and UNIDO. The committee is chaired by the GEF Focal point (Operations). The PSC is envisaged to meet twice a year.

Project's Executing Partners are: Federal Ministry of Power, Energy Commission of Nigeria, and Federal Ministry of Environment.

Table 3 below gives an overview of all Project stakeholders and their responsibilities on the Project.

Table 3. Role of counterpart organizations

Stakeholder	Role in the Project
Federal Ministry of Power	The FMP is a member of the project steering committee. This role stems from the fact that the biomass power plant project is in the jurisdiction of the power sector. The project has to be implemented within the framework of the sector reforms and would benefit from available incentives in the sector. The representative of the FMP on the project steering committee brings the perspectives of the Ministry to discussions at meetings.
Energy Commission of Nigeria	In view of the mandate of the ECN, it's Director General is the Chair of the project steering committee. The ECN also serves as the Secretariat for the project and a Deputy Director in the Commission is the National Project Coordinator. Accordingly, the ECN is expected to provide strategic direction for successful project implementation
Federal Ministry of Environment	The role of the FMEnv cuts across the entire project life cycle from planning to evaluation. As the Global Environment Facility (GEF) Operational Focal Point for Nigeria , the Ministry is responsible for receiving project proposals for GEF funding, screening of proposals, selection of proposals, project approvals, and endorsement of projects to the GEF Secretariat in Washington. The FMEnv is also a member of the project steering committee.
The Nigerian Electricity Regulatory Commission	As the parastatal organization of the Federal Government to regulate the power sector of the Nigerian economy, the NERC is a member of the project steering committee. This is particularly important in view of the fact that the biomass power plant to be constructed needs licensing and the intervention of the Commission to distribute the power to be generated.

The following are the stakeholders of Abakaliki Power Plant Limited.

- Ebonyi State Government
- United Nations Industrial Development Organisation (UNIDO)
- Global Environmental Facility(GEF)
- Bank of Industry(BOI)
- Energy Commission of Nigeria (ECN)
- Federal Ministry of Environment and other Federal Departments
- Private Millers
- Africa Finance Corporation (AFC)

The roles of each of the partners are summarized in the table below.

Table 4. Roles of stakeholders

Stakeholder	Role in the Project
Ebonyi State Government	Ebonyi State Government is the lead partner and beneficiary. The Government is responsible for ownership, provision of land, infrastructure and general favourable environment.
United Nations Industrial Development Organisation (UNIDO)	Responsible for Technical support and partner with Global Environmental Facility (GEF) to provide support for the project. UNIDO attracted major stakeholders like Bank of Industry.
Global Environmental Facility	GEF is funding relevant aspects such feasibility, bid process, Owners Engineer, Mini-grid etc.
Bank of Industry	Bank of Industry is providing the Federal Government's power fund for the project. The Bank of Industry is also a shareholder in APPL.
Energy Commission of Nigeria	ECN is responsible for co-ordination of the National Steering Committee and secretariat.
Federal Ministry of Environment	The Ministry is the GEF Focal point.
Private Millers:	They are the direct energy users. They are also shareholders and providers of rice husk to fuel the plant.
Africa Finance Corporation:	Africa Finance Corporation is in charge of evaluation and processing of power fund for the project.

Project benefits

Global environmental benefits

The proposed biomass based mini-grid project is expected to reduce a considerable amount of CO_2 emissions, which otherwise would have resulted from the use of diesel generators, as is currently the case in Nigeria (this is the baseline). In addition, this project has huge replication potential of about 25 MW3 using the agro residues generated in many of the agro processing industries. If this potential is realized, then there will be a considerable reduction in the energy related CO_2 emissions in Nigeria. Moreover, the energy supply situation in the country will also be improved remarkably.

Based on the data collected, it has been estimated that over the project's lifetime of 20 years, the project will be instrumental in reducing 501,936 t CO_2e directly and 2,509,680 tCO_2e indirectly over a period of 20 years.

Though there is a good potential for biomass projects in Nigeria, biomass power projects are not happening as the investment cost is high especially when it is developed for the first time. Also the investor confidence is low in the absence of GEF. When GEF support, the project investors are encouraged to invest in the project and realize it, resulting in the global environmental benefits. If this 5 MW project is implemented successfully with GEF support, it would act as catalyst for further replication of biomass projects, thus contributing to more global environmental benefits.

Institutional continuity and replicability and sustainability of global environmental benefits

The outputs to be generated by the GEF UNIDO Project Components 1, 2, 3 and 4 aim and contribute towards creating an environment favourable for implementation of several biomass projects. The outputs are consistent with and instrumental in achieving the objectives of Nigerian key energy policies as well as the recommended plan of actions.

Project Component 1: Development of techno-economic feasibility studies and business plan for identified potential sites to facilitate replication

One of the key aspects for replicability of the project and sustainability of global environmental benefits depends upon the identification of technically feasible and commercially viable projects. In the project component 1, through detailed techno-economic feasibility studies for the identified potential sites, technical and financial viability of the sites will be thoroughly studied and a business plan will be prepared for each site. Also, through other support and development activities, this project component will contribute towards the replication of the sites.

Project component 2: Demonstration of techno-economic viability of biomass based mini-grid

The 5 MW biomass power plant project to be implemented in PC 2, will demonstrate the technology, economics and environmental benefits of the project throughout Nigeria. Through the training programmes aimed for biomass power plant O&M as well as mini-grid management, sustainable operation of the power plant is ensured. This will further ensure the sustainability of global environmental benefits resulting from the operation of the biomass power plant.

The monitoring, evaluation and dissemination of the results of 5 MW biomass power plant implementation and operation will increase the replicability of similar projects in Nigeria and will also increase the global environmental benefits on the whole In addition to that, the result of the mini-grid monitoring and evaluation will assist in the replication of several other mini-grids in Nigeria.

Though the capacity of implemented project is 5 MW, the capacity of replicable biomass projects are not necessarily exactly the same size, but it can be of any size ranging from 1 MW to 20 MW capacity.

Project component 3: Strengthening of financial and policy environment to support RE based mini-grid systems

Once FiT for biomass power plant and appropriate financing facility is in place, several similar biomass power plant projects will be replicated and this will assure additional global environmental benefits. The FiT for biomass power plant implemented by the Government is expected to ensure pre-defined income from biomass projects and will completely eradicate the electricity off-take risks and income risks, thereby resulting in increased interest among the investors to invest in biomass power plant projects.

The financing facility created will be a big boost for institutional continuity and replicability of the project.

Project component 4: Capacity development for replication of RE mini-grid technologies.

Once local capacity in designing the mini-grids are developed and the experts, planners and institutions are trained in developing biomass based energy and mini-grid systems, the confidence of developing biomass based mini-grid projects locally will be enhanced. Study tours to the demonstration project site will further enhance their confidence and capacity in developing biomass based mini-grids. When local capacity of financing institutions is developed, the financing possibilities of several other biomass mini grid projects in the future will be enhanced.

Strengthening of RE related institutions will significantly help in the enhancement of skills in biomass project development and knowledge in assessment and operation of biomass mini-grid projects in Nigeria. This local knowledge base is very crucial with respect to the institutional continuity and the replicability of biomass projects in Nigeria in future. This will also ensure the sustainability of global environmental benefits.

Moreover, under this component, a one stop information centre for biomass/RE project will be established. The centre will conduct trainings and workshops for relevant government staff, as and when required, for capacity development, in Biomass/Technologies. This will ensure the development of human and institutional capacity in these areas. In addition, nationwide awareness programmes will be conducted on biomass power generation/RE.

Training to local engineering companies and O&M companies on operation and maintenance of biomass mini-grids will boost their knowledge and confidence.

All the above aspects will favour institutional continuity, replicability and global environmental benefits of the project.

Preliminary resource assessment conducted during the PPG stage indicated that the power generation potential in rice, sugar, palm oil and wood sectors alone was above 50 MW. Though the demonstration project belongs to the rice sector, the principle is exactly the same for other biomass sectors also. A replication potential of total 25 MW is assumed for the next 10 years which is conservative and practically achievable target. This target is justified as there are several wood clusters, rice mill clusters, sugar mills, palm oil mills, already in place in Nigeria which has high potential to implement such biomass projects.

Risks

Table 5 bellow gives an overview of the main risks to the effective implementation of the Project identified in the project design phase.

Table 5 Risks identified in the project design phase

Component	Risk	**Potential impact**	Probability	Risk Management
Institutional risk	Inadequate policy, regulatory and institutional framework	Medium	Very low	As the project is designed as independent mini-grid project and is not connected to the national grid, it faces less regulatory issues and hurdles. But, all these hurdles are expected to increase the investment and operation cost. Though, there are some legal procedures to be followed, they are manageable and do not pose serious implementation risk
Technical risk	Power plant not in operation for its designed life time	High	Very low	Internationally accepted best practice project development steps will be carried out in the implementation of mini-grid project. High quality, experienced equipment supplier with proven track record will be considered. A fixed price, time bound contract will be signed with the EPC contractor having adequate performance guarantees and related liquidated damages for noncompliance. Project performance such as gross and net power generation, equipment warranty, etc. will also be managed by selecting the EPC contractor with proven track record.
Market risk	No off-takers for the generated electricity	Medium	Very Low	The electricity generated from the power plant is supplied to the rice mills and the other customers. The present demand of electricity outstrips

Component	Risk	Potential impact	Probability	Risk Management
				the supply and hence there will not be any risk for electricity off-take.
Financial risk	No investors willing to invest in biomass mini-grid	High	Low	In Project Component 2, UNIDO will mobilize investors to invest in the biomass mini-grids. During the last four years, UNIDO has conducted several activities related to the biomass power plant projects in Nigeria and already created awareness among the potential investors and lenders. Such activities already carried out by UNIDO in Nigeria is expected to help successful mobilization of financing both in the form of equity investment and loan for the mini-grid projects.
Implementation risk	Failure of project implementation	Medium	Very Low	UNIDO will mitigate this risk through detailed development of activities plans in close cooperation with in country project partners, stakeholders and developers. Agreed and transparent modus operandi will be defined before the start of the project implementation
Sustainability risk	Failure to achieve project outcomes and objective after successful delivery of outputs	High	Very Low	One of the project components is to train the operators for the sustainable operation of the power plant. Moreover, local industries will be identified and trained in the equipment maintenance activities during the project implementation stage and they will be engaged by project owners for future maintenance activities along the life time of the biomass power plants. The project investors' commercial interest in the project will ensure sustainable operation of the project.
Climate change risk	Floods	Moderate	Low	Power plant building, fuel storage area and site office will be located on an elevated area to prevent flooding. All buildings and structures will be designed and built appropriately to prevent flooding.

3. Project assessment

The review assesses the project performance and progress against the evaluation criteria: relevance, effectiveness, efficiency, sustainability and impact. It provides an analysis of the attainment of the main objective and specific objectives under the four core project components.

The key question of the mid-term review is **to what extent the project is achieving the expected results at the time of the mid-term review, i.e. to what extent the project has promoted renewable energy (biomass) based mini-grid as an alternative to diesel based energy generation systems in Nigeria**.

The specific goals of the review are:

- To ascertain results (output, outcome, impact) and assess the effectiveness, efficiency and relevance of the project;
- To provide findings, conclusions and recommendations.
- To secure smooth further project implementation and achievement of project goals.

3.1 Project design and relevance

3.1.1 Relevance

The Project is consistent with the focal areas/operational program strategies of GEF and very relevant to the national development and environmental priorities and strategies of the Government and population of Nigeria, and regional and international agreements.

The project is consistent with the GEF Climate Change focal area Strategic programme SP-4: Promoting sustainable energy production from biomass. As described in the climate change focal area strategy, the proposed project will contribute positively to the Renewable Energy market transformation process, which will result in reduced fossil fuels use and GHG emission reductions. The project also promotes sustainable electricity generation from biomass.

UNIDO works in three main thematic areas. (I) poverty alleviation, (II) Trade capacity using the value chain approach, and (III) environmental energy / environmental protection. The Project falls under the theme of environmental energy / environmental protection of UNIDO programs.

The Project's objectives are in line with Nigeria's national strategies and objectives for promotion of rural electrification and renewable energy including biomass power in Nigeria, in particular:

(1) The National Energy Policy (NEP 2003)

It covers all the energy sectors. The key objectives and targets for the power sector are (i) to expand electricity access to 75 % of the population by 2020, (ii) to provide electricity supply for all local government headquarters and other cities by 2010 and (iii) to promote private sector participation. It involves the development and promotion of the country's renewable energy resources, promotion of

decentralized energy supply, especially in rural areas, based on RE resources, promotion of efficient methods in the use of biomass energy resources, following the trends of international developments in renewable energy technologies and applications and discouraging the use of wood as fuel.

(2) The Electricity Power Sector Reform Act (EPSR 2005)

The Federal Government set a target for increasing electricity access in rural areas from 40 % in 2005 to 75 % by 2015. The rural electrification strategy and plan aim at the expansion of the main grid, the development of isolated and mini-grid systems, the creation of an enabling environment to promote investments in RE power generation and the fostering of public and private sector partnerships designed to supply electricity for the rural population.

(3) Nigerian Renewable Electricity Policy (NREP 2006)

The objectives of this policy are (i) to promote biomass as an alternative energy resource especially in the rural areas, (ii) to promote efficient use of agricultural residues, animal and human wastes as energy sources and (iii) to reduce health hazards arising from open burning of biomass resources and agricultural residues. In also supports the construction of independent renewable electricity systems in areas not covered by the electricity grid to provide power service for local economic activities and sustainable living

(4) Renewable Energy Master Plan (REMP 2007)

It envisages aggregating the electrification demand of 14,000 MW by 2015 of which RE will constitute about 5 % (701 MW). In 2025, the electricity demand is projected to increase to 29,000 MW with RE satisfying up 10 % of the country's overall energy demand. REMP targets contributions to the electricity supply mix from biomass sources to around 50 MW for the year 2015 and 400 MW for the year 2025 respectively.

The Project has been identified as relevant at the time of its conception and preparation, considering the energy situation. Now, the Project is even more relevant having in mind the wide gap between energy supply and demand and the cost of energy in Nigeria at this moment.

The project intended to power an efficient modern rice mill facility that will lower the cost of milling rice and ensure the viability, profitability and productivity. It will also power the university, hospital, government houses, schools, local communities which brings social effects.

The project will facilitate the transfer of rice milling activities from Abakaliki (the state capital) to the new designated rice cluster at Ikwo thus eliminating the vast environmental impacts arising on the old cluster site by the accumulation of rice husk.

This Project will generate a lot of direct and indirect employment and added economic benefits.

3.1.2 Design

The Project design is very in line with the national developmental needs of the country considering the power shortfall and adequate to address the problems at hand. It has

been based on the outcome of various studies and verifications conducted by both external and internal consultants through a long period of time.

A long period of time and a number of preparatory activities precede to the actual commencement of the implementation of the Project. The rice husk Power Plant project was initiated through the collaboration of UNIDO and Ebonyi State Government in 2007. The pre-feasibility study was presented to Ebonyi State Government in 2008 by the UNIDO Consultant. The following activities lead to a commencement of the Project and its implementation:

1. Pre-feasibility investigation by UNIDO was done in 2007.
2. First Feasibility report publication and fund mobilization with Banks was held at UN House Abuja in February 2008.
3. Project presentation to Ebonyi State Government by UNIDO and official project approval by the State Executive Council was also made in February 2008.
4. Resource verification for plant sizing was completed by UNIDO in 2009.
5. Full scale feasibility study report was completed by UNIDO in 2010.
6. Stakeholders/State level steering meetings (1st to the 8th meeting) was held at Abuja, Abakaliki and Lagos from October 2009 to August 2010.
7. Establishment of the generation company APPL and distribution company EECPCL.
8. Allocation of 5hectares of land for the project by the State Government.
9. Inauguration of the Abakaliki Power Plant (APPL) Board of Directors was held at UN House, Abuja in November 2010.

The preparatory process has been based on wide consultations and participatory approach involving relevant national counterparts and beneficiaries participating in the identification of critical problem areas and the development of technical cooperation strategies.

The project was formulated based on the logical framework approach which was found to be adequate but it may requires to be reviewed considering the delay in implementation over time and the recommended extension.

The project has a very clear thematically focused development objective, the attainment of which can be determined by a set of verifiable indicators, some of them set in the logical framework.

The final design of the project is in line with the approved PIF. Further context analysis, review of existing barriers, meetings with various stakeholder groups carried out during the PPG phase, have confirmed the strong relevance of the original UNIDO GEF project and its additionality to ongoing and planned national programs to promote and support increased renewable energy based electricity in Nigeria.

Although the design is simple and fits the needs, it is not completely as outcome and output seem to be mixed and targets and indicators are not quite precise.

Example:

- Expected output 2.2. “Capacity on biomass power plant operation and maintenance as well as mini-grid management developed.”; “The mini-grid independently monitored, evaluated, lessons learnt and information widely distributed.”

- Expected output 2.3. “The mini-grid independently monitored, evaluated, lessons learnt and information widely distributed.”

These are outcomes, not outputs as indicated in the logical framework.

Some of the outputs are not SMART[1] as they are not specific nor can be measured.

- Expected output 2.2, Target: “Number of operators identified and trained for the operation and maintenance of power plant and management of mini-grid.”

This output as given in the framework is not measurable since no clear indication of the number of operators has been given, but is rather general.

Some outputs are not quite clear as they don’t give enough explanation on what exactly will be implemented.

Example:

- Output 3.2 Target “Appropriate financing facility developed for RE related projects”.

The output nor the project design (document) does not carry sufficient information what kind activities are foreseen to be implemented within this output or how they will be implemented. Further one, there is no explanation what would differentiate such output from the existing Power fund set within the BoI, so duplication would be avoided.

Barriers

The table below outlines the barriers identified in the participatory process conducted within the preparatory works intended to be overcome by the design.

Table 6. Project barriers at stage of preparation

Barriers	Explanation
Lack of awareness and data	- Lack of awareness about the biomass power generation among all sectors of the population such as the project developers, financial institutions, engineering companies, insurance companies, construction companies, private investors, etc. - Lack of knowledge and expertise to implement the biomass based power generation and mini-grid projects in Nigeria.
Policy and regulatory barriers such as lack of FiT	- No defined and well framed path ways that make the policies successful enough to bring the desired outputs. - No FiT scheme for the biomass based mini-grid projects.
Lack of human and institutional capacity	- Lack of technical capacity of various stakeholders, such as the project developers, engineering companies, insurance companies, construction companies, investors, local employees hired for operation and maintenance, etc. and the institutions, such as the Federal

[1] SMART (Specific, Measurable, Attainable, Relevant, Trackable).

Barriers	Explanation
	Government, related Ministries, financing institutions, etc., - No full scale demonstration projects for biomass based mini-grid where interested stakeholders can visit to gain knowledge and confidence.
Financing/private sector investments in RE	- Obtaining finance for these projects are difficult in Nigeria. - Lack of capacity within the financial institutions in understanding, assessing and evaluating biomass projects. - Private investors are also hesitant to invest in biomass mini-grid projects, as the investment costs are higher when compared to that of fossil fuel power plant.

The Project aims at promoting RE, mainly in the form of biomass based mini-grids as viable options for augmenting the rural electrification programme in at Ikwo cluster, Ebonyi state Nigeria. Ikwo cluster is a new cluster being developed by Ebonyi State Government. One of the companies to start construction of a rice mill in the cluster is Ebonyi Agro, a private enterprise. In addition to this, Ebonyi State Government is also planning a 5 tph rice mill in this cluster. Rice mill association's 3 tph mill is also expected to come in this cluster. The existing Abakaliki rice mill cluster is expected to close soon and a part of the mills are expected to be relocated to this cluster. Ebonyi State Government has assured to give land at free of cost in the Ikwo cluster, for those existing rice mills in Abakaliki, to encourage relocation.

The 5 MW rice husk based power generation project will be installed within the Ikwo rice mill cluster which generates around 63,750 tons of rice husk per year. Annual rice husk requirement for the power plant will be 45,030 tons per year. It is clearly evident that there is surplus rice husk available in the cluster.

After GEF intervention, the rice mills in the Ikwo cluster, Ebonyi State are expected to get electricity directly from the 5 MW rice husk power plant replacing diesel generators for electricity. In addition, hospital, University, school, local communities, etc. in the nearby area of the power plant will also get electricity from the power plant. Hence, the use of fossil fuel based electricity (from diesel generators) will also be reduced.

As the rice mills get electricity from the 5 MW rice husk power plant, considerable reduction in milling cost is expected. This will result in significant growth of rice milling sector in Ebonyi State which will increase the rice farming as well. The increased rice production and millings are expected to increase the employment opportunities, revenue generation, etc. for the local people. Moreover, increased electricity availability to University, hospital, Government Houses, school, local community, etc. will also increase their quality of life and productivity.

Use of biomass electricity will save significant amount of diesel and hence will save significant cash outlay from the State for the purchase of diesel. This savings can be used for other productive uses. The demonstration of technical and financial viability of 5 MW biomass based power generation and mini-grid will enable the Government to further establish appropriate policy and regulatory framework, to strengthen institutions

and to build capacity leading to the creation of a conducive market environment for increased private sector investment programmes in renewable energy.

The proposed biomass based mini-grids to be set up under the project are expected to bring about global benefits in reducing 501,936 t CO2e directly and 2,509,680 t CO2e indirectly, for a period of 20 years, which otherwise would have resulted from the use of diesel generators, as is currently the case in Nigeria.

The project is also expected to bring about considerable socio-economic benefits by improving the electricity access situation, industrialization and employment generation. The implementation of 5 MW biomass based mini-grid project will reduce the energy cost of rice milling and save a considerable amount of spending on diesel, which can be diverted to the other economic activities. By selling rice husk to the power plant, the rice mills also get economic benefit. The project will bring new technology, knowhow and skill level to Nigeria. The increased availability of power will spur the growth of other industries nearby the project location. The direct and indirect employment generation will be an added economic benefit.

In addition, the project has huge replication potential, where the agro residues generated in the agro processing industries will be utilized. If this potential is realized, there will be a considerable reduction in the energy related CO_2 emissions in Nigeria and the energy supply situation in the country will be improved.

Summary of findings

- ❑ Project design is in line with the national developmental needs of the country considering the power shortfall.
- ❑ The project design was based on the outcomes of various studies and verifications conducted by both external and internal consultants
- ❑ The project was based on wide consultations and participatory approach involving all relevant national counterparts and beneficiaries.

3.2 Effectiveness

This subchapter gives an overview to what extent have the expected outputs, outcomes and long-term objectives been achieved or are likely to be achieved.

Progress of the Project

Project component 1- Development of techno-economic feasibility studies and business plans for identified potential sites to facilitate replication.

Outputs/Activities:

a. Reconnaissance survey on biomass resources in Nigeria and identify the three potential sites
b. Prefeasibility study for the three potential sites
c. Develop techno-economic study report for the potential sites

Almost all of activities have been implemented so far. A Survey on biomass resources in Nigeria and identification of the three potential sites and Prefeasibility

study for the three potential sites has been completed. Based on that, a Request for proposal to conduct detailed techno-economic study for the potential sites has been already published and it is expected that the Report is going to be completed in October this year.

Project component 2 - Demonstration of techno-economic viability of biomass based mini-grid.

Output/Activities:

2.1 A biomass based power plant of 5 MW installed capacity commissioned in the selected site along with mini-grid

a. Arranging the necessary licenses, permits for construction of the biomass power plant
b. Study on insurance required for the plants during construction and operation
c. Preparing bidding document for EPC contractor
d. Launching the bid document, bidding, evaluating and selecting the EPC contractor
e. Financial closures
f. Construction and commissioning of the WTE plants
g. Conducting expert inspection during construction and commissioning by Owner's Engineers

2.2 Capacity on biomass power plant operation and maintenance (O & M) as well as mini-grid management developed

h. Prepare and finalize O&M work plan
i. Preparation of training materials for O&M and mini-grid management
a. Training to identified personnel on O&M and mini-grid management

2.3 The mini-grid independently monitored, evaluated, lessons learnt and information widely distributed

a. Preparation of leaflets and website for information dissemination
b. Disseminating the information through leaflets and website

All preparatory activities necessary for implementation of the second and most significant output – the demonstration project, have been completed. All necessary licenses, permits for construction of the biomass power plant have been arranged, Study on insurance required for the plants during construction and operation is completed, Bidding document for EPC contractor have been prepared, the bid document launched, Bidding, evaluating and selecting the EPC contractor is already completed, Financial closures are done and an EPC contract has been selected. Procedure for construction approval in the state will be followed when the EPC Contractor brings up the construction and building design, the designs will be sent to the Ministry of Lands and Capital Territory for approval and stamping.

The construction of the biomass power plant has not begun yet.

The rest of the outputs are related to the demonstration project and are not completed so far:

- Capacity on biomass power plant operation and maintenance (O & M) as well as mini-grid management developed,
- The mini-grid independently monitored, evaluated, lessons learnt and information widely distributed.

Project component 3 - Strengthening of financial and policy environment to support RE based mini-grid systems

3.1 Feed-in-tariff (FiT) for biomass power in place

a. Gap analysis on policy requirements for RE based min-grid systems
b. Recommendation on FiT for biomass power plants

3.2 Appropriate financing facility developed for RE related projects.

a. Establishment and operation of the financing facility
b. Raising awareness among the stakeholders on the availability of financing facility through seminars and road shows

A study on the Gap analysis on policy requirements for RE based min-grid system has been completed. The activity is based on engagement of national experts for compiling various studies done so far in Nigeria related to FiT scheme and international experts for studying, developing and recommending appropriate FiT for the Government. The creation of the Feed-in-tariff scheme was also helped by liaising with relevant national agencies and organization of consultative workshops to get a feedback on the FiT scheme, assisted by the Project.

The rest of the activities of this Component are foreseen to be implemented in the third and fourth year:

- Establishment and operation of the financing facility,
- Raising awareness among the stakeholders on the availability of financing facility through seminars and road shows.

Project component 4 - Capacity development for replication of RE mini-grid technologies

4.1 Local capacity in designing mini-grid developed

a. Preparation of training materials for designing mini-grids
b. Training to identified personnel on designs of mini-grid

4.2 Experts, planners and institutions trained in developing biomass based energy and mini-grid systems

a. Preparation of training materials for developing biomass based mini-grid systems
b. Training to identified personnel on developing biomass based mini-grid systems

4.3 Capacity of RE related and financing Institutions strengthened

a. Preparation of training materials for RE related projects for financial institution
b. Training to financial institutions on RE related projects designs

4.4 Capacity of local engineering firms and O&M companies developed in operation and maintenance of biomass power plant and mini-grid systems

a. Preparation of training materials for developing biomass based mini-grid systems
b. Training to identified personnel on designs of mini-grid

These activities should provide capacity building for replication of RE mini-grid technologies and they are tied to the implementation of the second component, in particular the construction and operation of the power plant. Consequently, these activities are no completed.

Full preview on the implementation of the Project's activities is given in Annex F.

Achievement of the outcomes

In terms of achievement of the outcomes and expected behavioural changes, it must be noticed that although the Project is somewhere in the middle and there is a delay on the demo project implementation, there are noticeable benefits. The awareness about the project and the expected results it seems to be higher, the stakeholders are more confident in the outcomes particularly now when the relevance of the Project is bigger. All shareholders are showing strong commitment, particularly the Ebonyi State Government; everyone is eager to see the demo project done and even more a replication of the project in the clusters.

Even more, recognizing the benefits of the project and its wider opportunities that may bring in terms helping with the electricity shortage on a regional level and socio economic benefits, the State Government wants to replicate this project in all the three new clusters[2].

In terms of awareness as achievement, the biomass based mini-grid project is the first of its kind in Nigeria and as such has attracted the attention of public and private sector stakeholders to its implementation. The implementation of the demonstration project and its actual operation for sure is expected to bring a lot more attention. Due to that, a visibility on the achievements of the demo project is recommended to be put to ensure more awareness.

Perception of the quality of outputs

According to the reports, minutes of meetings and the interviews, the stakeholders feel that everyone shows strong commitment and they are very happy with results so far. They acknowledge the delays and feel they are regrettable but the reasons are cogent and critical and have helped to strengthen the project. They are keenly interested to see this Project completed since it will intervene with the acute power shortage facing this part of the world. Last but not least, they are all most grateful to UNIDO and GEF for the intervention that for sure will lead to a successful implementation and rapid replication as Nigeria has high biomass resource base.

[2] Minutes of meeting held at Un House Abuja on 20th August, 2010.

1. Most of the activities foreseen for the first period have been completed.
2. Due to the delays of the Project, the implementation of the demonstration project has not commenced yet and due to that the capacity building activities are in a standby mode (Component 4).
3. There is strong interest for completion of the Project and high awareness among all stakeholders.

3.3 Efficiency

This subchapter gives an overview on the extent to which the Project has produced the results (outputs and outcomes) within the expected time frame.

The progress of the project was assessed against the existing results framework and corresponding targets and indicators. Having some of the targets and indicators not sufficiently clear, makes the assessment little bit difficult.

In absence of an effective progress monitoring tool, the project office was asked to deliver a simple work plan table with progress on the project component activities versus the project timeline (annex F).

It is obvious that due to the delays that happened in the past period, the most important Project output, construction of biomass power plant is running late, together with some other Project activities that are closely related to it.

Following is a brief discussion on the delivery of output within the expected Project time frame.

Project component 1- Development of techno-economic feasibility studies and business plans for identified potential sites to facilitate replication.

Activities of Component 1 are foreseen to be completed within the first two years of the Project. Almost all of them have been implemented within the given timeframe, except for the last one, *Development of techno-economic study report for the potential sites,* running couple of months late behind the schedule.

Project component 2 - Demonstration of techno-economic viability of biomass based mini-grid.

Component's 2 activities also have been scheduled to be completed in the first half of the Project's timeframe. All preparatory activities necessary for implementation of the demonstration project have been completed within the given project timeframe.

However, there is a significant delay on the construction of the biomass power plant. According to the Project's work plan, this activity was scheduled to commence in the middle of the second year and to last for 18 months.

The rest of the outputs are related to the demonstration project and because of that its implementation has not commences yet:

- Capacity on biomass power plant operation and maintenance (O & M) as well as mini-grid management developed,
- The mini-grid independently monitored, evaluated, lessons learnt and information widely distributed.

Project component 3 - Strengthening of financial and policy environment to support RE based mini-grid systems

The activities of output 3.1 *Feed-in-tariff (FiT) for biomass power in place*, scheduled for the second Project year, have been completed.

The rest of the activities of this Component, part of output 3.2 *Appropriate financing facility developed for RE related projects,* are foreseen to be implemented in the third and fourth year:

- Establishment and operation of the financing facility,
- Raising awareness among the stakeholders on the availability of financing facility through seminars and road shows.

Project component 4 - Capacity development for replication of RE mini-grid technologies

This Component's activities are related to capacity building and foreseen to be implemented from year 1 to year 3. These activities are expected to provide capacity building for replication of RE mini-grid technologies and they are tied closely to the implementation of the second component, in particular the construction and operation of the power plant. Hence, the implementation of these activities have not commenced yet.

Full preview on the Project's progress is given in Annex F.

The inputs from the UNIDO have been provided as planned and were adequate to meet the requirements. The same may be said for the State Government as well in terms of delivery of the prerequisites necessary for the demo project such as providing a new cluster location and appropriate infrastructure, construction of APPL and EPC building. However, it has to be noticed that State Government has failed to deliver the first release on the milestone payment according to the Contract timeframe.

Efficiency is the function of implementing a project less than the original cost or using the least cost options without sacrificing quality. This project has been unduly delayed and this obviously has an efficiency implications. It may be argued that foreign components and contracts denominated US dollars may be assumed to be stable.

Summary of findings

- ❑ Project progressing is as planned in Component 1 and part in Component 2, but there is lagging over planned regarding the implementation of the demonstration project.
- ❑ Due to the delay on the demo project, there is delay in the implementation in some connected activities related to capacity building.

3.4 Assessment of sustainability of project outcomes

Sustainability is understood as the likelihood of continued benefits after the GEF project ends. Assessment of sustainability of outcomes will be given special attention but also technical, financial and organization sustainability will be reviewed. This assessment should explain how the risks to project outcomes will affect continuation of

benefits after the GEF project ends. It will include both exogenous and endogenous risks. The four dimensions or aspects of risks to sustainability are addressed:

- Financial risks
- Socio-political risks
- Institutional framework and governance risks
- Environmental risks

The Project design phase identified several main risks to the effective implementation of the Project. The situation with the risks after the first part of the implementation period is presented in the table below.

Table 7 Sustainability risks, before and after

Component & Risk	Potential impact & Probability	Risk Management	Current status
Institutional risk Inadequate policy, regulatory and institutional framework	Medium Very low	As the project is designed as independent mini-grid project and is not connected to the national grid, it faces less regulatory issues and hurdles. But, all these hurdles are expected to increase the investment and operation cost. Though, there are some legal procedures to be followed, they are manageable and do not pose serious implementation risk	The Project stimulated good cooperation between national agencies, particularly in the process of FiT preparation. The generation company APPL and distribution company EECPCL are already established. Stakeholders show strong commitment.
Technical risk Power plant not in operation for its designed life time	High Very low	Internationally accepted best practice project development steps will be carried out in the implementation of mini-grid project. High quality, experienced equipment supplier with proven track record will be considered. A fixed price, time bound contract will be signed with the EPC contractor having adequate performance guarantees and related liquidated damages for noncompliance. Project performance such as gross and net power generation, equipment warranty, etc. will also be managed by selecting the EPC contractor with proven track record.	No changes.
Market risk No off-takers for the generated electricity	Medium Very Low	The electricity generated from the power plant is supplied to the rice mills and the other customers. The present demand of electricity	The generation company APPL and distribution company EECPCL are already established. The relevance of the Project is

Component & Risk	Potential impact & Probability	Risk Management	Current status
		outstrips the supply and hence there will not be any risk for electricity off-take.	bigger now than in the beginning. The electricity shortage and its need become bigger.
Financial risk No investors willing to invest in biomass mini-grid	High Low	In Project Component 2, UNIDO will mobilize investors to invest in the biomass mini-grids. During the last four years, UNIDO has conducted several activities related to the biomass power plant projects in Nigeria and already created awareness among the potential investors and lenders. Such activities already carried out by UNIDO in Nigeria is expected to help successful mobilization of financing both in the form of equity investment and loan for the mini-grid projects.	Stakeholders show strong commitment for the Project. The Project's activities attracted the attention of public and private sector stakeholders to its implementation. The implementation of the demonstration project and its actual operation for sure is expected to bring a lot more attention. However, more visibility is necessary on the demo project, once it becomes operational.
Implementation risk Failure of project implementation	Medium Very Low	UNIDO will mitigate this risk through detailed development of activities plans in close cooperation with in country project partners, stakeholders and developers. Agreed and transparent modus operandi will be defined before the start of the project implementation	There is an actual delay on the implementation of the project – demo project. The reasons are more administrative, rather than technical. The State Government expresses strong commitment and assures continuity of the implementation. Stakeholders and UNIDO agrees on one more strong push on the implementation.
Sustainability risk Failure to achieve project outcomes and objective after successful delivery of outputs	High Very Low	One of the project components is to train the operators for the sustainable operation of the power plant. Moreover, local industries will be identified and trained in the equipment maintenance activities during the project implementation stage and they will be engaged by project owners for future maintenance activities along the life time of the biomass power plants. The project investors' commercial interest in the project will ensure sustainable operation of the	UNIDO has trained 7 local engineers on biomass technology that are currently operating the demonstration biomass plant in the state. They will continue plant operation and management at the departure of the Expertries. The EPC contractor will also provide in-house O&M .

Component & Risk	Potential impact & Probability	Risk Management	Current status
		project.	
Climate change risk Floods	Moderate Low	Power plant building, fuel storage area and site office will be located on an elevated area to prevent flooding. All buildings and structures will be designed and built appropriately to prevent flooding.	

* L = low risk; M = medium risk; H = high risk

Couple of more risks have been assessed in regards to the implementation of the project,, its second period and sustainability as well.

Table 8 Discussion of additional risks to the sustainability

S/N	RISK	RISK MANAGEMENT
1.	**Non Performance by other partners/shareholders**	Ebonyi State Executive Council decision is that Ebonyi State Government will take over shares of any non-performing partner.
2.	**EPC Contractors withdrawal**	The bid process made provision for reserved bidders who are of the same capability with the selected bidder.
3.	**Sustainability Issues**	The project is sustainable. UNIDO has trained 7 local engineers on biomass technology that are currently operating the demonstration biomass plant in the state. They will continue plant operation and management at the departure of the Expertise. The EPC contractor will also provide in-house O&M .
4.	**New Government Administration in the state from 29th May, 2015**	The incoming Governor is the Deputy Governor who has being responsible for driving and attending all UNIDO policy meetings. The incoming administration is fully aware of the project and will full drive the project with speed.

3.4.1 Financial risks

Ebonyi State Government is the lead partner and beneficiary of the Project and responsible for ownership, provision of land, infrastructure and general favourable environment. As such, the State Government is expected to release the first milestone payment, according to the contract with the EPC Contractor.

The State Executive Council approved the release of milestone payments in January, 2014 on the internal memo with ref No.EBS/MFED/COMM/1/502. Release of the approved milestone payment however met with budget process issues because the 2014 budget did not capture the entire cost. The budget process made fund release impossible in 2014, hence the delay in fund release to the EPC Contract.

The budget process was duly completed in 2014 and the fund required is now fully captured in the 2015 budget which is currently with the House of Assembly. This is a government transition year in Nigeria and the new administration that will operate the

budget commenced on 29th May, 2015. The Deputy Governor who has been in charge of the project and has been representing government in all the meetings with UNIDO is the new Governor. There is no gap in the system and release of fund is expected to follow after the new administration takes off.

Change of government brings a certain risks of sustaining on the ongoing course and possibility for jeopardizing the outcomes, although the risk for this happening is low according to the minutes of meetings and the stakeholders. The honorable commissioner for public utilities, Ebonyi State, engr. Ben Okah also showed strong commitment expressing his believes that his successor will continue the good work and make sure that the plant becomes operational soon. He also stressed that quite a lot has been accomplished in the project implementation and it will therefore be a huge loss to all the Stakeholders if the project is not accomplished[3].

The activities of component 2 of the project when implemented will expose the technology, economics and environmental benefits of the project throughout the country which is expected to result in lowering the risk.

In this context is also the fact of the interest shown by the key stakeholders since the inception of the project particularly the willingness of the Ebonyi State Government to invest continuously in the project and even thinking of taking the project to public domain.

3.4.2 Sociopolitical risks

The country has received positive momentum from the elections, but still faces strong regional challenges. Despite a strong economic track record, poverty is significant, and reducing it will require strong non-oil growth and a focus on human development. Constraints to growth, such as the investment climate; infrastructure, incentives and policies affecting agricultural productivity as well as quality, and relevance of tertiary education have been identified. Capacity is weak in most states, and improving governance will be a long term process.

The successful outcome of the Presidential and Governorship elections held respectively during March 28-29 and April 11 enhances Nigeria's macroeconomic prospects, going forward. In spite of earlier measures to deal with emerging macroeconomic challenges, such as the depreciation of the exchange rate in response to lower oil prices, fears of possible conflict or instability surrounding the elections cast a cloud of uncertainty over prospects for higher investment and placed continued pressure on reserves. Given that these fears did not materialize, the balance of payments pressures are likely to subside in the near future.

Though Nigeria's socio-political environment is fairly stable, there are pockets of instability in some parts of the country. The fifth consecutive national elections in March and April 2015 were largely successfully conducted, further consolidating democratic rule which began in 1999.

There is a real need for energy not only for rice processing but also for general purposes. This is what is most important and recognized by all stakeholders and drives the process forward.

[3] Interview with honorable commissioner for public utilities, Ebonyi State, engr. Ben Okah, 20th May 2015, Abakaliki, Ebonyi State

Public/ stakeholder awareness is medium and needs to be worked on in order to create necessary awareness on the immediate, short-term and long-term objectives of the project. This awareness will go a long way to attract investors, developers, governments at all levels, civil society organizations etc to invest on the project and similar projects in other parts of the country where biomass materials are in abundant. This will also attract funds that will ensure sustainability.

Now that the election period is over, the socio political situation is expected to stabilize, although certain risk will still present in the near future.

3.4.3 Institutional framework and governance risks

According to the review of the existing relevant project documents and interviews with stakeholders, the legal frameworks, policies, and governance structures and processes within which the project operates do not pose risks that may jeopardize sustainability of project benefits.

The completion of the study on Gap analysis on policy requirements for RE based min-grid systems and the consultative processes with various stakeholders stimulated by the project resulted in development of FiT scheme which is expected to be adopted very soon. This will further foster the implementation process and even more the process of replicability.

All necessary institutional arrangements and committees have been established and their roles and responsibilities clearly defined. The real issue is their functionality and regularity. Establishment of entities like APPL and Ebonyi Electricity Company LTD will also support sustainability.

As an independent mini-grid project and is not connected to the national grid and will not be encumbered with much regulatory issues although there are some legal procedures to be followed.

Additional stability is expected to come with the training of experts, planners and institutions in developing biomass based energy and mini-grid systems which will come in the second part of the Project.

3.4.4 Environmental risks

No environmental risks have been identified that may jeopardize the sustainability of the project outcomes.

The Project for establishing a biomass based plant and its components for research and capacity building are expected to achieve numerous environmental benefits to the country, especially seen through a long-term process of replicability.

The relocation of the old cluster to a new location with appropriate infrastructure and more environmentally friendly location will result in mitigation of several negative environmental impacts present on the old location.

The old cluster is a source of emissions to air (uncontrolled burning), land and ground waters that pose a significant risk to the nature and people's health, particularly because of its vicinity to residential areas.

The use of the rise husk waste as a fuel can be seen as a future final solution for this kind of wastes as it a huge existing problem in the region and on a national base.

Additionally, the implementation of this project and its replicability may stimulate the process of waste selection and reuse bringing added value in the waste management chain in the country.

Summary of findings

- There is a high level of collaboration between stakeholders and involvement in the project activities.
- There are no issues that may pose significant possible risk affecting the sustainability of the Project, once the first payment is done.
- In financial terms, considering the commitments expressed so far and the resources invested in the Project, it is not much likely that the change of the Government would pose risk on the financial commitments to the Project.
- There is clear ownership over processes in terms of institutionalization should ensure sustainability beyond the project duration.

3.5 Assessment of monitoring and evaluation systems

This section assesses the M&E systems in place for the project. The M&E plan describes how the whole M&E system for the project works and includes the indicators who is responsible for collecting them, what forms/tools will be used, and reporting schedules. The M&E plan includes the project logframe, baseline reports, periodic reports, and other documentation such as minutes of meetings, documentation of activities etc.

M&E design

The project has a plan for M&E. It includes the Project Results Framework, the annual work plans as well as detailed progress and activity reports. The plan also includes and budgets for a mid-term review and a final project evaluation.

The project logframe follows the United Nations Development Assistance Framework (UNDAF) and the main principles of Results Based management (RBM). As such, the logframe highlights the main objectives, indicators, baselines where applicable, targets and sources of verification; and risks and assumptions.

There is main concern related with the M&E design and that is some indicators /targets are not reflective of the related outcomes and are not SMART in some instances.

Furthermore, there should be a clear distinction between the indicator and target phrasing. The indicator is a measure. It is usually quantitative (although there are qualitative indicators) and can be expressed as a number, ratio, percentage, etc. A target is a clear statement of the intended or desired results for a specific indicator over a specified period of time. The wording of the indicators and the targets and outcomes and outputs in the results framework needs to clearly reflect these distinctions. Moreover, the indicators and targets need to relate directly to the outcome stated. Clearly not all the indicators and targets need to be adjusted, as some are very specific.

As previously discussed, at some instances the outcomes seem to be mixed with the outputs. Example:

- Expected output 2.2. “Capacity on biomass power plant operation and maintenance as well as mini-grid management developed.”; “The mini-grid independently monitored, evaluated, lessons learnt and information widely distributed.”
- Expected output 2.3. “The mini-grid independently monitored, evaluated, lessons learnt and information widely distributed.”

These clearly are outcomes, not outputs as indicated in the logical framework.

Some of the outputs are not SMART[4] as they are not specific nor can be measured.

- Expected output 2.2, Target: “Number of operators identified and trained for the operation and maintenance of power plant and management of mini-grid.”

This output as given in the framework is not measurable since no clear indication of the number of operators has been given, but is rather general.

Some outputs are not quite clear as they don’t give enough explanation on what exactly will be implemented.

Example:

- Output 3.2 Target “Appropriate financing facility developed for RE related projects”.

The output nor the project design (document) does not carry sufficient information what kind activities are foreseen to be implemented within this output or how they will be implemented. Further one, there is no explanation what would differentiate such output from the existing Power fund set within the BoI, so duplication would be avoided.

M&E Implementation

The project has an M&E system in place and it is implemented by the PMU as it was designed for the project. Whilst there are some comments on the design of the system as detailed in the section above, the actual implementation of the standing plan is carried out efficiently by the PMU. The annual workplans are developed as per the project format and progress reports are completed, assessing implementation against targets and indicators as stated in the logframe. In this regards a minor concern is in the frequency of the meetings, since the inception report and general agreement is to meet twice a year (there was no SC meeting in 2014 and no work plan for that year is identified).

The PMU will be responsible for continuous monitoring of project activities execution, performance and track progress towards milestones. The project manager is responsible for a) tracking and monitoring the project performance with respect to each project activity and output, b) the overall project milestones and progress towards the attainment of the set project outputs and c) for the narrative reporting to the GEF.

[4] SMART (Specific, Measurable, Attainable, Relevant, Trackable).

The Project has been subject to another external review as part of the Country Program Audit done by the UNIDO HQ Audit office.

Internal review and support is ongoing for the project. The Project manager is active in project activities, attends Steering Committee meetings and is updated and involved in the overall management of the project, providing valuable support as needed. In addition, the UNIDO is well aware of the project activities, has a great working relationship with PMU and is also involved in the Steering committee meetings. Overall, the support and oversight provided by the program management to the PMU is satisfactory.

Budgeting and funding for M&E activities.

The Project provides provisions for two project evaluations/review, mid-term and final one. The Project management budget includes tentative budget for the total evaluation which seems to be sufficiently budgeted.

Summary of findings

- ❑ The project has a plan for M&E which includes the Project Results Framework, the annual work plans as well as detailed progress and activity reports, and budgets for a mid-term review and a final project evaluation.
- ❑ At some instances, the objectives and performance Indicators are not SMART.
- ❑ At some instances, the outcomes are mixed with outputs.

3.6 Assessment of processes affecting achievement of project results

The Review considered additional issues that may affect project implementation and attainment of project results.

3.6.1 Preparation and readiness / Quality at entry

Project's objectives and components seem to be clear and understood by the stakeholders and very well accepted.

Counterpart resources and project management arrangements were in place at project entry, capacities of executing institution and counterparts were properly considered when the project was designed. Furthermore, partnership arrangements were properly identified and the roles and responsibilities negotiated prior to project approval.

A state project office was created and a State Project Coordinator was appointed to manage and coordinate the activities of the project. The office provides significant help and coordination on the ground, with a number of engineers already recruited for training to provide services and support to project implementation.

3.6.2 Country ownership/driven-ness

With the serious energy shortage in the Nigeria, the Project is consistent with national's priority plans and very in line with the sectoral and development priorities of the country. The outputs are consistent with and instrumental in achieving the

objectives of Nigerian key energy policies as well as the recommended plan of actions. Having in mind the ongoing energy crisis, the project's concept is complementary to the government efforts in providing a solution the electricity shortage issue.

All relevant government representatives and beneficiaries were involved in the project and ready to participate financially, particularly the Ebonyi State Government.

The Project will contribute immensely to the nation's socio-economic development. The increased milling and production of rice resulting from the demo project implementation is expected to increase the opportunities for employment and revenue generation on a local level. In addition to the rice mills, University, Government guest house, hospital, school and other local communities in the nearby area will be receiving the electricity from the power plant. Use of biomass electricity will save significant amount of diesel, which otherwise would be used by them in diesel generators for electricity. The amount spent by general public and commercial and industrial establishments on the purchase of diesel for power generation can be utilized for other alternative productive purposes.

Although agreed, because of the circumstances the recipient government so far did not maintain its financial commitment to the project in terms of making a release on the first installment. According to the records and the interviews, there is an evident strong support and commitment from the government expressing their assurance for standing firmly to their role. Furthermore, the Ebonyi State has continued to pay all the costs on the budget because other shareholders insist on waiting until all other arrangements are completed.

3.6.3 Stakeholder involvement

The project consulted widely and used both local and international skills and knowledge. Studies and plant specifications were done by local and international consultants and experts. Wide consultations involving all concerned including the beneficiaries, non-beneficiaries, the vulnerable and the powerful were made considering the importance and contribution of the project to socio-economic development of the people and institutions in and around the project site.

Ebonyi State Government is the lead partner and beneficiary. The Government is responsible for ownership, provision of land, infrastructure and general favorable environment. Hence, the Project makes appropriate consultations with and uses the skills, experience, and knowledge in the implementation of the project activities on the ground.

In regards to the ownership issue, the State Government shows proactive role and commitment, driving the process on the ground and taking the rest of the APPL stakeholders on the way. The Ebonyi field office is fully dedicated to the implementation of the processes, responsible and fulfilling.

However, remains the fact that the Government failed to deliver on its first concrete step and to release the approved milestone payment.

Steering committee has been established to review the progress, to facilitate co-ordination among project shareholders and to maintain transparency in ensuring

ownership and to support for the sustainability of the project. However, without a national Project coordinator acting as a link between the SC and the Project it seems that coordination lacks together with sharing information.

The SC was envisaged to meet twice a year, but so far SC had four meetings. According to the SC stakeholders there is a need for more frequent meetings or at least regular update on the progress and sharing of information.

3.6.4 Financial planning

The Project has appropriate financial controls, including reporting and planning that allows management to make informed decisions regarding the budget and allows for timely flow of funds.

UNIDO manages the overall project budget and procures all services required, and as well prepares financial reports to the GEF, in accordance to the established UNIDO rules and regulations and applicable GEF requirements.

So far there have not been significant procurements so far since the project activities in the first period related more to procurement of services rather than equipment.

3.6.5 UNIDO's supervision and backstopping.

UNIDO staff provides quality support and advice to the project coming from different UNIDO HQ departments and also hired international consultants bringing the best available knowledge and practice, continuity and frequency of field visits for the project, identifying problems in a timely manner and providing appropriate response.

There is absence of a qualified person on the position of national project coordinator in the last several months due to incapability of the last man working on that position. The responsibilities of this position had been covered by the UNIDO representative officer in the country. Although the absence had not significantly influenced on the implementation of the Project, a qualified coordinator is necessary to enable continued work and co-ordination of steering committee.

3.6.6 Co-financing and project outcomes and sustainability.

A special company had been established, Abakaliki Power Plant Company, for the purpose of promoting a risk husk power plant proposed as a demonstration project. This company had been established through an equity participation of four (4) entities:

- Ebonyi State Government,
- Ebony Agro Company Ltd,
- Bank of Industry Limited, and
- Abakaliki Rice Mill Owners Association.

In its purpose and for the proposed demonstration project, Abakaliki Pover Plant Company is agreed to mobilize through equity and debts instruments and invest USD 9,375,000.00.

The support and commitment is backed up with a Commitment letter from the Nigeria Federal Ministry of Environment expressing their intentions for funding of USD 2,300,000.00 in cash and kind.

So far, the Government had invested in providing new location for the relocation off the cluster, necessary infrastructure on the field and construction The EPC residential quarters and APPL Offices have been completed. On Equity status, Ebonyi State has continued to pay all the costs on the budget.

However, although approved by the State Executive Council[5], the release of milestone payment had not been yet done. Hence, no payments have been done from the other stakeholders.

3.6.7 Delays and project outcomes and sustainability.

The rice husk Power Plant project was initiated through the collaboration of UNIDO and Ebonyi State Government in 2007. The pre-feasibility study was presented to Ebonyi State Government in 2008 by the UNIDO Consultant. Since inception, the project implementation has been vigorously pursued but the following genuine factors have delayed the process.

1. **Rice husk verification to determine the plant size**.

This verification was occasioned by UNIDO to ensure sustainability. On UNIDO's advice, detailed resource verification on quantity of rice husk available for use was carried out to enable determination of the size of the plant, which led to the decision of 5MW plant capacity. The Stakeholders meeting therefore commenced formally in 2009 while the full scale feasibility report was released in 2010.

2. **Development of modern rice clusters in the State resulting in change of project site.**

A study also occasioned by UNIDO advice which led to the change from old model diesel milling machine to efficient rice milling technology. UNIDO introduced the idea of efficient rice milling to the State Government to change the old model diesel milling machines used in the State and by way of replication Government decided to established three modern rice clusters located at the three Senatorial Zones of the State. Government also established 5ton/hr efficient rice milling machines in each of the three zones. UNIDO established a 3ton/hr efficient rice mill in one of the Clusters and a private miller established 12ton/hr efficient rice mill in another cluster.

3. **Technology verification by Ebonyi State Government.**

Renewable energy especially biomass technology is entirely new in this part of the world. After site selection, Government wanted to understand the difference between steam turbine technology chosen by UNIDO and biomass gasification recommended by other groups. Government clarified that the investment is a huge one and it is justified to have a good clarification. This gave rise to setting up the State EXECO Technical Committee to advice the State Government. This also led to the decision of the State Executive Council to send a high powered EXCO delegation on study visit which was organized by UNIDO in India and China. This long process led to the

[5] Internal memo with ref No.EBS/MFED/COMM/1/502

conclusion that UNIDO decision on steam turbine technology is justified for the size of the plant. Once the technology issues were resolved, the State Government became the driver of the project.

4. **Delay arising from review of signed Contract**

After contract signing, Africa Finance Corporation (AFC) who is providing the power fund facility identified areas for amendment which led to UNIDO contracting an American Firm to handle the review accordingly. The process of amending the contract to suit AFC demand between APPL and contract reviewer and also between APPL and EPC contractor was part of the delay. Although this has caused delay in the contract implementation but the process is a genuine and inevitable one in favour of the project.

Budget process for release of approved milestone payment:

Right from the time technology issue was resolved, Ebonyi State Government has moved the project implementation on fast tract lane with other stakeholders. Bid process was completed and EPC Contractor selected in September, 2013. Signing of Contract was done in a session of the State Executive Council, UNIDO and other UN Representatives and chaired by the State Executive Governor on 8th November, 2013.

The State Executive Council approved the release of milestone payment, however the release met with budget process issues because the 2014 budget did not capture the entire cost. The budget process made fund release impossible in 2014, hence the delay in fund release to the EPC Contract.

The budget process was duly completed in 2014 and the fund required is now fully captured in the 2015 budget which is currently with the House of Assembly. This is a government transition year in Nigeria and the new administration that will operate the budget commenced on 29th May, 2015. The release of fund is expected to follow after the new administration takes off.

The contract with the EPC contractor has been signed in November 2013. Although, there is close relation maintained with the contractor and willingness to wait for the first payment, any further delays may cause developments with delays. Any review of the contract conditions may result in potential amendments of the contract and delays.

3.6.8 Implementation approach

The implementation approach related to the Project complies with other approaches applied by UNIDO.

The Project and its approach promotes local ownership and capacity building using a combination of market push via demonstration project, delivery of trainings and capacity building.

As designed, the GEF funding is removing several barriers that had been identified for the development and implementation of biomass mini-grid projects in Nigeria. Through this Project, GEF provides the necessary technical assistance for the development and implementation of biomass mini-grid projects through improved policies and compatible financial environment. The GEF funding to be used in the 5 MW biomass

mini-grid demonstration project will demonstrate the technical feasibility and commercial viability of biomass mini-grid projects, which will help in replication of such projects in future.

3.7 Project coordination and management

The national management and overall coordination mechanisms seems to be efficient and effective. All parties seem to be aware of their roles in the Project and act within their appropriate responsibilities, some more some less.

UNIDO is implementing the Project in close consultation with Ebonyi State Government as lead partner and beneficiary and the SC according to the established UNIDO rules and regulations and applicable GEF requirements.

UNIDO is responsible of implementing the project, the delivery of the planned outputs and the achievement of the expected outcomes. The project will be executed by UNIDO in collaboration with the concerned Federal Ministries, State Governments and the private sector stakeholders. UNIDO will be responsible for:

- The general management and monitoring of the project,
- Reporting on the project performance to the GEF.
- Procuring the international expertise needed for delivering the planned outputs under the four project components.
- Managing, supervising and monitoring the work of the international teams and ensuring that the deliverables are technically sound and consistent with the project requirements.

The major stakeholders in the project include Ebonyi State Government, UNIDO, Bank of Industry and private millers. Other stakeholders at the National Steering level include the Energy Commission of Nigeria which chairs and maintains the secretariat and relevant Federal Ministries and parastatals such as Ministry of Environment. According to the opinion of the honorable commissioner for public utilities of Ebonyi State, the relationship and cooperation among the stakeholders have been very cordial which has been the key factor behind the successful implementation of the above project activities.

The roles and responsibilities of all Project partners have been identified from the beginning and outlined in the project design. Each of the partners is aware of its responsibilities and acting appropriately.

The SC provides strategic guidance on the project implementation and facilitates the coordination of various Government authorities and institutions. To ensure sustainability, strategic relevance and appropriate national coordination, the SC is established with the participation of the key stakeholders with a concrete mandate. So far, there have been four SC meetings, three in Abuja and one in Abakaliki. The SC was envisaged and agreed to meet twice a year which is not entirely fulfilled.

Abakaliki Power Plant is managed by a Board of Directors inaugurated in November 2010, on a meeting held at UN House, Abuja. The Board holds its own regular meetings dealing with APPL related issues.

The project implementation is managed on a daily basis by the Project Management Unit in Abuja and a field office in Abakaliki. The PMU receives necessary management and monitoring support from UNIDO (Country office and HQ) and monetary support from GEF and counterparts. The responsibilities of PMU will be as follows:

- Coordination of all project activities carried out by the national experts and other partners by having close association with the Ministry of Energy/State Governments.
- Day-to-day management, monitoring and evaluation of project activities as per planned project work.
- Organization of the various seminars and trainings to be carried out under Project Components 2, 3 and 4.

Although foreseen to be within the Energy Commission of Nigeria, the PMU was set within the UNIDO Country Office. A National Project Manager was recruited, however it did not deliver on its responsibilities, hence was released from his duties. The roles of the Project manager for the time being are covered by the UNIDO Country representative. Although this does not seem to have reflected significantly on the project implementation, a lack of coordination and information sharing is identified.

3.8 Assessment of gender mainstreaming

The project is gender sensitive. The project office in Ebonyi State has 3 staff team and 2 are females. Construction of building and other facilities going on in the site has above 60% females. At the completion of the plant, it is planned that the rice husk transfer from rice mill to the plant will be handled by the women in a modern form. Currently, women are handling the rice husk from the dump at the old cluster.

3.9 Procurement issues

UNIDO is accountable to the GEF for the management of the funds of the Project, implementing the Project according to the established UNIDO rules and regulations and applicable GEF requirements. This means managing the overall project budget and procuring all services required, timely preparation of appropriate financial reports and submission to the GEF and the Project Steering Committee.

4. CONCLUSIONS, RECOMMENDATIONS AND LESSONS LEARNED

4.1 Conclusions

UNIDO's Mini grid based renewable energy sources to augment rural electrification Project is an excellent and very important concept with a numerous benefits on different levels.

The Project is very in line with country's national strategic plans on energy, environment and socio-economic level.

The Project for sure will bring great number of benefits on a local, regional and national level:

Economic benefits:

- Considerable reduction in milling cost,
- Significant growth of rice milling sector,
- Increase in the rice farming,
- Saving significant amount of diesel and hence saving significant cash outlay from the State for the purchase of diesel,
- Improving the industrialization situation.

Institutional benefits:

- Enabling the Government to further establish appropriate policy and regulatory framework,
- Strengthen institutions and build capacity leading to the creation of a conducive market environment for increased private sector investment programmes in renewable energy.

Social benefits:

- Improving the employment generation situation,
- Improving the electricity access situation, industrialization
- Access to new technologies and know how, thus local capacity building and skills,
- Increased electricity availability to University, hospital, Government Houses, school, local community,
- Increase their quality of life and productivity,
- Engagement of local companies,

Environmental benefits:

- Electricity generation from the biomass will also result in global environmental benefit in the form of CO2 emission reduction by replacing fossil fuel based power generation.
- Prevention of large environmental impacts in form of air, soil and ground water emissions coming from rise husk waste, thus preventing health hazards.
- Preventing air emissions from diesel generators for electricity that are going to be replaced.
- Final disposal solution for this type of waste.

- Stimulation of waste selection.

Maybe more important is the fact that there is huge possibility for replication of the concept model that could bring multiplication of all those above mentioned benefits for the whole country and region of West Africa, since this is a first Project of this kind.

The project is very relevant considering the energy situation, the wide gap between energy supply and demand and the cost of energy in Nigeria. Even more, all stakeholders recognize its importance and embrace the outcomes.

Huge amount of human and material resources have been invested in this project. There is great commitment coming from all the stakeholders, especially UNIDO and the owner Ebonyi State Government. It is an opinion of the stakeholders that there is good cooperation and relationship which has been the key factor behind the successful implementation of the project activities so far and a base for continuity. The delays are regrettable but the reasons are cogent and critical and have helped to strengthen the project.

At this stage it is essential that all stakeholders give a good push within their roles and responsibilities. It is an opinion of the review team that there is no significant technical barrier that can stand on the way of the implementation once the first milestone payment is done by the owner of the Project.

However, there is room for improvement for each of the parties. UNIDO and the stakeholders need to make one good push on the implementation in order to overcome the most important obstacle – the first payment. Also, there is room for improvement in the management and coordination particularly having in mind that more important part of the project is yet to come in the second period.

Generally, the Project is being managed and implemented in a satisfactory level, but unfortunate to run into a unpleasant situation that led to a long delay.

4.2 Recommendations

Based on the review and findings of this report, the review team prepared several recommendations that can contribute to the achievement of the Project outcomes and outputs and the overall Project objective.

The recommendations are separated according to the designees into: recommendations to UNIDO and recommendations to Stakeholders.

UNIDO:

- A delegation from UNIDO headquarters and Country Office to visit the new Governor on fund release as soon as possible.

  This is a crucial stage of the Project and all major parties need to have a meeting to reaffirm their roles and agree to make a strong decisive push on the implementation. Having heard that all administrative barriers on the fund release are now eliminated, it is necessary that all stakeholders get a reaffirmation on the commitment from the owner of the Project and a concrete date for the fund release.
  The Bank of Industry, as major stakeholder in APPL, on their interview meeting with the review team confirmed their commitment and expressed readiness to participate on such meeting in order to consolidate the Project position on its

implementation path. The meeting needs be organized and to happen as soon as possible. Thereupon, the SC should be informed appropriately.

- UNIDO should make a serious case for the extension of the project life for 2 to 3 years.

  In order to capture the positive situation that has been created for a long time during the implementation of the project activities, and due to the delays that happen, it is necessary that the implementation is given more time. The extension time should mainly include the time for construction of the plant which according to the Contract should be 18 months, but also the time necessary for capacity building.

- Considering the fact that the next period is going to be more significant with construction of the power plant and the capacity building activities, there is need for periodic supervision and follow up missions to support project implementation and monitoring in the following second period.

- The financial commitment issued by the Nigerian Federal Ministry of Environment is outdated since it refers to the period of 2010 – 2014. UNIDO may consider requesting for an update of the commitment.

- A National Project Coordinator should be immediately designated and domicile at the Electricity Commission of Nigeria (ECN).

  The Project Coordinator should act as a connection between the SC and the PMU. This means intensive coordination activities, regular updating of SC with the latest developments on the project implementation. PMU may consider preparation of monthly communication letter to the SC as an effective information dissemination tool.

- Objectives and performance Indicators need to be SMART (Specific, Measurable, Attainable, Relevant, Trackable), and should, where possible indicate expected number of outputs. Where possible, the framework or the work plans should be revised as to give enough information about the outputs and targets, according to the findings.

- Once the power plant is constructed, the PMU may consider awareness campaign in order to provide visibility on the demo project once it starts its operations. This should attract more attention among the private sector in terms of fostering the future replicability of the Project.

- The project logical result framework was found adequate but it may be necessary to be reviewed considering the delay in implementation over time and once the extension is granted.

Stakeholders:

- Ebonyi State Government should make an immediate payment of the first installment, as according to the agreements, showing a strong commitment and paving the road to the other APPL stakeholders.

- All stakeholders need to show a strong commitment to the Project implementation and act to their roles and responsibilities at a highest possible level.

- Outstanding payments and contributions by all stakeholders should be made in order to speed up implementation.
- APPL may consider contacting the ECP contractor to make sure there is no issues related to the Contract conditions in regards to the delay and possible review.

4.3 Lessons learned

The purpose of lessons learned is to bring together any insights gained during the project that can be usefully applied on future projects. Capturing lessons learned from the project implementation may result in more effective and efficient future roll out of activities. Capturing lessons learned and turning that hindsight into best practices you will achieve far greater long-term project success.

At this stage, it seems little but early to draw good lessons upon which one can learn more.

- An output and outcome should be measurable using indicators. It is important that the formulation of the outcome statement takes into account the need to measure progress in relation to the outcome and to verify when it has been achieved. The outcome should therefore be specific, measurable, achievable, relevant and time-bound (SMART).
- Raising awareness and disseminating information for the Project and the importance and relevance should be highly considered by the implementator and owner as replicability of the Project's concept will bring a great more achievement in the country.

Annex A: Terms of reference

TERMS OF REFERENCE

Independent mid-term evaluation of the UNIDO project:

Mini grid based renewable energy (biomass) sources to augment rural electrification

UNIDO Project No.: XXNIR09X01
UNIDO SAP ID: 100260
GEF Project ID: 3943

AUGUST/2014

CONTENTS

I. Project background and overview

1. Project summary

UNIDO's project "Mini-grids based on renewable energy (small-hydro and biomass) sources to augment rural electrification" (SAP ID:100260), funded by GEF aims at promoting Renewable Energy (RE), mainly in the form of biomass based mini-grids as viable options for augmenting the rural electrification programme at Ikwo cluster, Ebonyi State Nigeria. The project is expected to demonstrate biomass gasification technology in Nigeria under four broad thematic components: development of techno-economic feasibility studies and business plans; demonstration of techno-economic viability of biomass-based mini-grid; strengthening of financial and policy environment to support RE based mini grid-systems; capacity development for replication of RE mini-grid technologies. A 5 MW rice husk based power generation plant will be installed within the Ikwo rice mill cluster as a demonstration biomass power plant. The demonstration of technical and financial viability of 5 MW biomass based power plant and mini-grid will enable the Government to further establish appropriate policy and regulatory framework, to strengthen institutions and to build capacity leading to the creation of a conducive market environment for increased private sector investment programmes in RE.

The project document was signed in December 2011 and according to the same, a mid-term review is envisaged to be carried out approximately two years after implementation start date.

2. Project objective

The project goal is to reduce and avoid the GHG emissions from the energy sector of Nigeria. The project description is to develop policy and conducive market environment in order to promote renewable based mini-grids for augmenting rural electrification and productive uses in Nigeria.

The project immediate objective is to promote renewable energy (biomass) based mini-grid as an alternative to diesel based energy generation systems in Nigeria.

Output	Output indicators
1. Techno-economic feasibility studies and business plans developed for the 3 identified potential sites to facilitate replication	2 (Ebonyi and Ogun state) techno-economic feasibility studies developed
2. A biomass based power plant of 5 MW installed capacity commissioned in the selected site along with mini –grid.	A 5 MW rice husk based power generation plant has been identified within the Ikwo rice mill cluster in Ebonyi state. A techno-economic feasibility study has been developed, the project is in the final stage of selecting an Owners Engineer to supervise EPC contractor.
3. Capacity on biomass power plant operation and maintenance as well as mini-grid management developed.	
4. The mini-grid independently monitored, evaluated, lessons learnt and information widely distributed.	

Output	Output indicators
5. Feed-In-Tariff (FiT) for biomass power in place.	A FiT of (₦/MWh) 32,000 is being proposed for biomass projects in Renewable Energy Master Plan.
6. Appropriate financing facility developed for RE related projects.	Provision of low interest rate loans not exceeding 5 percent per annum by Bank of Industries (BOI) is available

3. Project implementation arrangements

UNIDO as GEF's Executing Agency is responsible for implementing the project, the delivery of the planned outputs and achievement of the expected outcomes. UNIDO is executing the project in collaboration with Federal Ministry of Energy, Energy Commission of Nigeria and Federal Ministry of Environment, Housing and Urban Development.

UNIDO is responsible for:

- The general management and monitoring of the project;
- Reporting on the project performance to the GEF;
- Procuring the international expertise needed for delivering the planned outputs under the four project components; and
- Managing, supervising and monitoring the work of the international teams and ensuring that the deliverables are technically sound and consistent with the project requirements.

A Project Management Unit (PMU) has been established within the Energy Commission of Nigeria. The PMU consist of a Project Manager (PM) and the Project Administrative Assistant (PAA). The responsibilities of PMU are as follows:

- Coordination of all project activities carried out by the national experts and other partners by having close association with the Ministry of Energy/State Governments;
- Day-to-day management, monitoring and evaluation of project activities as per planned project work; and
- Organization of the various seminars and trainings to be carried out under Project Components 2, 3 and 4.

Since the implementation of the project, the PMU has received the necessary management and monitoring support from UNIDO and the monetary support from GEF and counterparts.

A Project Steering Committee (PSC) has been established. This committee has being reviewing progress of project implementation, to facilitate co-ordination among project shareholders and to maintain transparency in ensuring ownership and to provide support for the sustainability of the project. The PSC has a balanced representation from key stakeholders including counterpart Ministries, public institutions and private sector representatives and UNIDO. The committee is chaired by the GEF Focal point (Operations) and meets twice a year.

A detailed work plan for the entire duration of the project has been developed by UNIDO in collaboration with the PMU, State Governments and international teams of experts. The working plan is used as management and monitoring tool by PMU and UNIDO and it is to be reviewed and updated appropriately on a biannual basis. Figure 1 presents a summary of the project implementation.

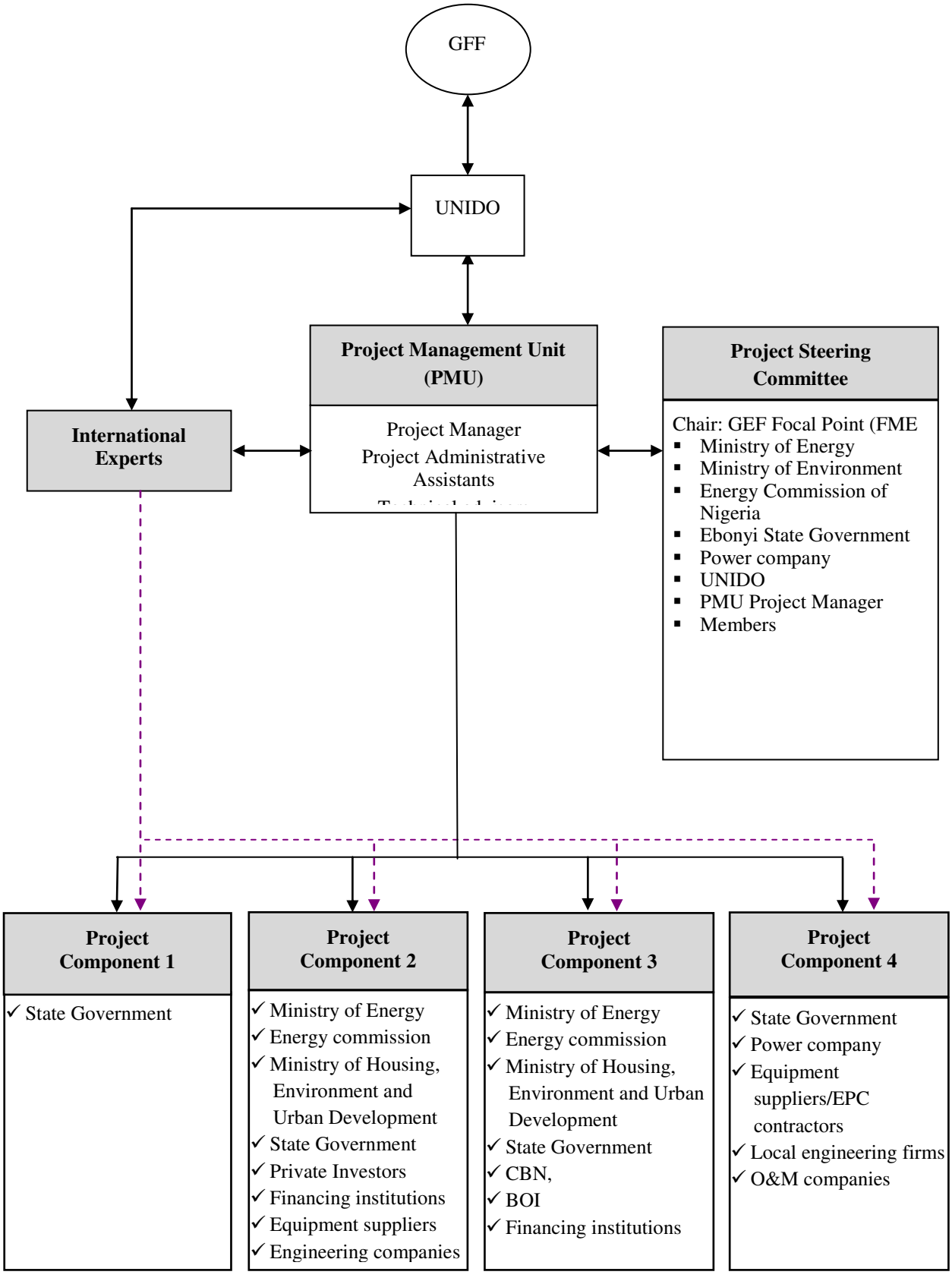


Figure 1:Diagram of project implementation arrangement

4. Budget Information

a) Overall cost and financing (including co-financing):

Project components/Outcomes	Co-financing ($)	GEF ($)	Total ($)
Development of techno-economic feasibility studies and business plans for identified potential sites to facilitate replication / Preparatory works completed for facilitating replication in the identified potential sites.	200,000	137,000	337,000
Demonstration of techno-economic viability of biomass based mini-grid/ Acceptance by stakeholders on the technical and financial viability of selected site for setting up of biomass based mini grid for rural electrification.	10,575,000	1,917,000	12,492,000
Strengthening of financial and policy environment to support RE based mini-grid systems/ Conducive financing and policy environment for promoting investments in rural mini-grids in place.	200,000	93,000	293,100
Capacity development for replication of RE mini-grid Technologies/Capacity of local planners, institutions and experts for RE based mini-grid enhanced.	500,000	274,800	774,900
Project management	460,000	200,000	660,000
Total	**11,935,000**	**2,681,800**	**14,616,800**

b) UNIDO budget execution (GEF funding excluding agency support cost in USD):

Budget line	Item	EXECUTED BUDGET in 2013	EXECUTED BUDGET in 2014	Total Expenditure
1100	International consultants	121,379.59	29,983.44	151,363.03
1500	Project related travels	36,599.14	27,652.17	64,251.31
1700	National short time consultants	21,411.34	47,378.21	68,789.55
2100	Sub contracts	21,473.18	9,600	31,073.18
4300	Maintenance	-	7,862.38	7,862.38
4500	Equipment	149,626.95	-	149,626.95
5100	Sundries	166,029.82	17,994.30	184,024.12

(as of 14/08/2014)

II. Scope and purpose of the mid-term review

The mid-term review will cover the duration of the project from its starting date in December 2014 to the estimated mid-term review date November 2014. It will assess project performance and progress against the evaluation criteria: relevance, effectiveness, efficiency, sustainability and impact.

The evaluation team should provide an analysis of the attainment of the main objective and specific objectives under the four core project components. Through its assessments, the evaluation team should enable the Government, counterparts, the GEF, UNIDO and other stakeholders and donors to:

(a) Verify prospects for development impact and sustainability, providing an analysis of the attainment of global environmental objectives, project objectives, delivery and completion of project outputs/activities, and outcomes/impacts based on indicators. The assessment includes re-examination of the relevance of the objectives and other elements of project design according to the project evaluation parameters defined in chapter VI.
(b) Enhance project relevance, effectiveness, efficiency and sustainability by proposing a set of recommendations with a view to ongoing and future activities until the end of project implementation.

The key question of the mid-term review is to what extent the project is achieving the expected results at the time of the mid-term review, i.e. to what extent the project has promoted renewable energy (biomass) based mini-grid as an alternative to diesel based energy generation systems in Nigeria.

III. Mid-term review approach and methodology

The mid-term review will be conducted in accordance with the UNIDO Evaluation Policy, the UNIDO Guidelines for the Technical Cooperation Programmes and Projects, the GEF's 2008 Guidelines for Implementing and Executing Agencies to Conduct Terminal Evaluations, the GEF Monitoring and Evaluation Policy from 2010 and the Recommended Minimum Fiduciary Standards for GEF Implementing and Executing Agencies.

It will be carried out as an independent in-depth evaluation using a participatory approach whereby all key parties associated with the project are kept informed and regularly consulted throughout the evaluation. The evaluation team leader will liaise with the Project Manager on the conduct of the evaluation and methodological issues.

The evaluation team will be required to use different methods to ensure that data gathering and analysis deliver evidence-based qualitative and quantitative information, based on diverse sources: desk studies and literature review, statistical analysis, individual interviews, focus group meetings, surveys and direct observation. This approach will not only enable the mid-term review to assess causality through quantitative means but also to provide reasons for why certain results were achieved or not and to triangulate information for higher reliability of findings. The concrete mixed methodological approach will be described in the inception report.

The evaluation team will develop interview guidelines. Field interviews can take place either in the form of focus-group discussions or one-to-one consultations.

The methodology will be based on the following:

1. A desk review of project documents including, but not limited to:
   - The original project document, monitoring reports (such as progress and financial reports to UNIDO and GEF annual Project Implementation Review (PIR) reports), output reports (case studies, action plans, sub-regional strategies, etc.) and relevant correspondence.
   - Notes from the meetings of committees involved in the project (e.g. approval and steering committees).

2. Other project-related material produced by the project.
3. The evaluation team will use available models of (or reconstruct if necessary) theory of change for the different types of intervention (enabling, capacity, investment, demonstration). The validity of the theory of change will be examined through specific questions in interviews and possibly through a survey of stakeholders.
4. Counterfactual information: In those cases where baseline information for relevant indicators is not available the evaluation team will aim at establishing a proxy-baseline through recall and secondary information.
5. Interviews with project management and technical support including staff and management at UNIDO HQ and in the field and – if necessary - staff associated with the project's financial administration and procurement.
6. Interviews with project partners including Government counterparts, GEF focal points and partners that have been selected for co-financing as shown in the corresponding sections of the project documents.
7. On-site observation of results achieved in demonstration projects, including interviews of actual and potential beneficiaries of improved technologies.
8. Interviews and telephone interviews with intended users for the project outputs and other stakeholders involved with this project. The evaluator shall determine whether to seek additional information and opinions from representatives of any donor agencies or other organizations.
9. Interviews with the relevant UNIDO Country Office and the project's management and Project Steering Committee (PSC) members and the various national and sub-regional authorities dealing with project activities as necessary. If deemed necessary, the evaluator shall also gain broader perspectives from discussions with relevant GEF Secretariat staff.
10. Other interviews, surveys or document reviews as deemed necessary by the evaluator and/or UNIDO EVA.
11. The inception report will provide details on the methodology used by the evaluation team and include an evaluation matrix.

IV. Evaluation team composition

The evaluation team will be composed of one international evaluation consultant acting as a team leader and one national evaluation consultant. The evaluation team should be able to provide information relevant for follow-up studies, including evaluation verification on request to the GEF partnership up to two years after completion of the mid-term review.

Both consultants will be contracted by UNIDO. The tasks of each team member are specified in the job descriptions attached to these terms of reference.

Members of the evaluation team must not have been directly involved in the design and/or implementation of the programme/projects.

The Project Manager at UNIDO and APPL will support the evaluation team. The UNIDO GEF Coordinator will be briefed on the mid-term review and equally provide support to its conduct. The UNIDO GEF Coordinator will be briefed on the mid-term review.

V. Time schedule and deliverables

The mid-term evaluation is scheduled to take place in the period from November 2014 to December 2014. The field mission is planned for December 2014. At the end of the field mission, there will be a presentation of the preliminary findings for all stakeholders involved in this project in Nigeria.

After the field mission, the evaluation team leader will come to UNIDO HQ for debriefing. The draft mid-term review report will be submitted 4-6 weeks after the end of the mission.

VI. Project evaluation parameters

The evaluation team will rate the projects. The ***ratings for the parameters described in the following sub-chapters A to K will be presented in the form of a table*** with each of the categories rated separately and with **brief justifications for the rating** based on the findings of the main analysis. An overall rating for the project should also be given. The rating system to be applied is specified in Annexes 1 and 2.

A. Project design

The mid-term review will examine the extent to which:

- The project's design is adequate to address the problems at hand;
- A participatory project identification process was instrumental in selecting problem areas and national counterparts;
- The project has a clear thematically focused development objective, the attainment of which can be determined by a set of verifiable indicators;
- The project was formulated based on the logical framework (project results framework) approach;
- The project was formulated with the participation of national counterpart and/or target beneficiaries; and
- Relevant country representatives (from government, industries and civil society) have been appropriately involved and were participating in the identification of critical problem areas and the development of technical cooperation strategies.

B. Project relevance

The mid-term review will examine the extent to which the project is relevant to the:

- National development and environmental priorities and strategies of the Government and population of Nigeria, and regional and international agreements. See possible evaluation questions under "Country ownership/driveness" below.
- Target groups: relevance of the project's objectives, outcomes and outputs to the different target groups of the interventions (e.g. companies, civil society, beneficiaries of capacity building and training, etc.).
- GEF's focal areas/operational programme strategies: In retrospect, were the project's outcomes consistent with the focal areas/operational program strategies of GEF? Ascertain the likely nature and significance of the contribution of the project outcomes

to the wider portfolio of GEF's Focal area of Climate Change, and Operational Program SP3: "Promoting market approaches to renewable energy".
- UNIDO's thematic priorities: Were they in line with UNIDO's mandate, objectives and outcomes defined in the Programme & Budget and core competencies?
- Does the project remain relevant taking into account the changing environment? Is there a need to reformulate the project design and the project results framework given changes in the country and operational context?

C. Effectiveness: objectives and planned final results at the end of the project

The mid-term review will assess to what extent results at various levels, including outcomes, have been achieved. In detail, the following issues will be assessed:

- To what extent have the expected outputs, outcomes and long-term objectives been achieved or are likely to be achieved?
- Has the project generated any results that could lead to changes of the assisted institutions?
- Have there been any unplanned effects?
- Are the project outcomes commensurate with the original or modified project objectives?
- If the original or modified expected results are merely outputs/inputs, the evaluators should assess if there were any real outcomes of the project and, if there were, determine whether these are commensurate with realistic expectations from the project.
- How do the stakeholders perceive the quality of outputs?
- Were the targeted beneficiary groups actually reached?
- What outputs and outcomes has the project achieved so far (both qualitative and quantitative results)?
- Has the project generated any results that could lead to changes of the assisted institutions?
- Have there been any unplanned effects?
- Identify actual and/or potential longer-term impacts or at least indicate the steps taken to assess these (see also below "monitoring of long term changes"). Wherever possible, evaluators should indicate how findings on impacts will be reported in future.
- Describe any catalytic or replication effects: the mid-term review will describe any catalytic or replication effect both within and outside the project. If no effects are identified, the mid-term review will describe the catalytic or replication actions that the project carried out. No ratings are requested for the project's catalytic role.

D. Efficiency

The extent to which:

- The project cost was effective?
- Was the project using the least cost options?
- Has the project produced results (outputs and outcomes) within the expected time frame?

- Was project implementation delayed, and, if it was, did that affect cost effectiveness or results?
- Wherever possible, the evaluator should also compare the costs incurred and the time taken to achieve outcomes with that for similar projects.
- Are the project's activities in line with the schedule of activities as defined by the project team and annual work plans?
- Are the disbursements and project expenditures in line with budgets?
- Have the inputs from the donor, UNIDO and Government/counterpart been provided as planned, and were they adequate to meet requirements?
- Was the quality of UNIDO inputs and services as planned and timely?
- Was there coordination with other UNIDO and other donors' projects, and did possible synergy effects happen?

E. Assessment of sustainability of project outcomes

Sustainability is understood as the likelihood of continued benefits after the GEF project ends. Assessment of sustainability of outcomes will be given special attention but also technical, financial and organization sustainability will be reviewed. This assessment should explain how the risks to project outcomes will affect continuation of benefits after the GEF project ends. It will include both exogenous and endogenous risks. The following four dimensions or aspects of risks to sustainability will be addressed:

✓ **Financial risks**
- Are there any financial risks that may jeopardize sustainability of project outcomes?
- What is the likelihood of financial and economic resources not being available once GEF assistance ends? (Such resources can be from multiple sources, such as the public and private sectors or income-generating activities; these can also include trends that indicate the likelihood that, in future, there will be adequate financial resources for sustaining project outcomes.)
- Was the project successful in identifying and leveraging co-financing?

✓ **Sociopolitical risks**
- Are there any social or political risks that may jeopardize sustainability of project outcomes?
- What is the risk that the level of stakeholder ownership (including ownership by governments and other key stakeholders) will be insufficient to allow for the project outcomes/benefits to be sustained?
- Do the various key stakeholders see that it is in their interest that project benefits continue to flow?
- Is there sufficient public/stakeholder awareness in support of the project's long-term objectives?

✓ **Institutional framework and governance risks**
- Do the legal frameworks, policies, and governance structures and processes within which the project operates pose risks that may jeopardize sustainability of project benefits?
- Are requisite systems for accountability and transparency, and required technical know-how, in place?

✓ **Environmental risks**

- Are there any environmental risks that may jeopardize sustainability of project outcomes?
- Are there any environmental factors, positive or negative, that can influence the future flow of project benefits?
- Are there any project outputs or higher level results that are likely to affect the environment, which, in turn, might affect sustainability of project benefits?
- The mid-term review should assess whether certain activities will pose a threat to the sustainability of the project outcomes.

F. Assessment of monitoring and evaluation systems

✓ **M&E design**

- Did the project have an M&E plan to monitor results and track progress towards achieving project objectives?
- The mid-term review will assess whether the project met the minimum requirements for the application of the Project M&E plan (see Annex 3).

✓ **M&E plan implementation.**

The mid-term review should verify that a M&E system was in place and facilitated timely tracking of progress toward project objectives by collecting information on chosen indicators continually throughout the project implementation period; annual project reports were complete and accurate, with well-justified ratings; the information provided by the M&E system was used during the project to improve performance and to adapt to changing needs; and the project had an M&E system in place with proper training for parties responsible for M&E activities to ensure that data will continue to be collected and used after project closure. Were monitoring and self-evaluation carried out effectively, based on indicators for outputs, outcomes and impacts? Are there any annual work plans? Was any steering or advisory mechanism put in place? Did reporting and performance reviews take place regularly?

✓ **Budgeting and Funding for M&E activities.**

In addition to incorporating information on funding for M&E while assessing M&E design, the evaluators will determine whether M&E was sufficiently budgeted for at the project planning stage and whether M&E was adequately funded and in a timely manner during implementation.

G. Monitoring of long-term changes

The monitoring and evaluation of long-term changes is often incorporated in GEF-supported projects as a separate component and may include determination of environmental baselines; specification of indicators; and provisioning of equipment and capacity building for data gathering, analysis, and use. This section of the mid-term review report will describe project actions and accomplishments toward establishing a long-term monitoring system. The review will address the following questions:

- Did this project contribute to the establishment of a long-term monitoring system?
- If it did not, should the project have included such a component?
- What were the accomplishments and shortcomings in establishment of this system?
- Is the system sustainable—that is, is it embedded in a proper institutional structure and does it have financing?
- How likely is it that this system continues operating upon project completion?
- Is the information generated by this system being used as originally intended?

H. Assessment of processes affecting achievement of project results

Among other factors, when relevant, the mid-term review will consider a number of issues affecting project implementation and attainment of project results. The assessment of these issues can be integrated into the analyses of project design, relevance, effectiveness, efficiency, sustainability and management as the evaluators find them fit (it is not necessary, however it is possible to have a separate chapter on these aspects in the mid-term review report). The mid-term review will consider, but need not be limited to, the following issues that may have affected project implementation and achievement of project results:

a. <u>Preparation and readiness / Quality at entry.</u>

- Were the project's objectives and components clear, practicable, and feasible within its time frame?
- Were counterpart resources (funding, staff, and facilities), and adequate project management arrangements in place at project entry?
- Were the capacities of executing institution and counterparts properly considered when the project was designed?
- Were lessons from other relevant projects properly incorporated in the project design?
- Were the partnership arrangements properly identified and the roles and responsibilities negotiated prior to project approval?

b. <u>Country ownership/drivenness</u>.

- Was the project concept in line with the sectoral and development priorities and plans of the country—or of participating countries, in the case of multi-country projects?
- Are project outcomes contributing to national development priorities and plans?
- Were the relevant country representatives from government and civil society involved in the project?
- Did the recipient government maintain its financial commitment to the project?
- Has the government—or governments in the case of multi-country projects—approved policies or regulatory frameworks in line with the project's objectives?

c. <u>Stakeholder involvement</u>.

- Did the project involve the relevant stakeholders through information sharing and consultation?
- Did the project implement appropriate outreach and public awareness campaigns? Were the relevant vulnerable groups and powerful supporters and opponents of the processes properly involved?
- Which stakeholders were involved in the project (i.e. NGOs, private sector, other UN Agencies etc.) and what were their immediate tasks?
- Did the project consult with and make use of the skills, experience, and knowledge of the appropriate government entities, nongovernmental organizations, community groups, private sector entities, local governments, and academic institutions in the design, implementation, and review of project activities?
- Were perspectives of those who would be affected by project decisions, those who could affect the outcomes, and those who could contribute information or other resources to the process taken into account while taking decisions?
- Were the relevant vulnerable groups and the powerful, the supporters and the opponents, of the processes properly involved?

d. <u>Financial planning</u>

- Did the project have appropriate financial controls, including reporting and planning, that allowed management to make informed decisions regarding the budget and allowed for timely flow of funds?

- Was there due diligence in the management of funds and financial audits? Did promised co-financing materialize?
- Specifically, the mid-term review should also include a breakdown of final actual project costs by activities compared to budget (variances), financial management (including disbursement issues), and co- financing.

e. UNIDO's supervision and backstopping

- Did UNIDO staff identify problems in a timely fashion and accurately estimate their seriousness?
- Did UNIDO staff provide quality support and advice to the project, approve modifications in time, and restructure the project when needed?
- Did UNIDO provide the right staffing levels, continuity, skill mix, and frequency of field visits for the project?

f. Co-financing and project outcomes and sustainability.

- If there was a difference in the level of expected co-financing and the co-financing actually realized, what were the reasons for the variance?
- Did the extent of materialization of co-financing affect project outcomes and/or sustainability, and, if so, in what ways and through what causal linkages?

g. Delays and project outcomes and sustainability.

- If there were delays in project implementation and completion, what were the reasons? Did the delays affect project outcomes and/or sustainability, and, if so, in what ways and through what causal linkages?

h. **Implementation approach[6].**

- Is the implementation approach chosen different from other implementation approaches applied by UNIDO and other agencies?
- Does the approach comply with the principles of the Paris Declaration?
- Does the approach promote local ownership and capacity building?
- Does the approach involve significant risks?
- The evaluation team will rate the project performance as required by the GEF. The ratings will be given to four criteria: Project Results, Sustainability, Monitoring and Evaluation, and UNIDO related issues as specified in annex 2. The ratings will be presented in a table with each of the categories rated separately and with brief justifications for the rating based on the findings of the main analysis. An overall rating for the project should also be given. The rating system to be applied is specified in the same annex. As per the GEF's requirements, the report should also provide information on project identification, time frame, actual expenditures, and co-financing in the format in Annex 4, which is modeled after the GEF's project identification form (PIF).

I. Project coordination and management

The extent to which:

- The national management and overall coordination mechanisms have been efficient and effective?
- Did each partner have assigned roles and responsibilities from the beginning?

[6] Implementation approach refers to the concrete manifestation of cooperation between UNIDO, Government counterparts and local implementing partners. Usually POPs projects apply a combination of agency execution (direct provision of services by UNIDO) with elements of national execution through sub-contracts.

- Did each partner fulfil its role and responsibilities (e.g. providing strategic support, monitoring and reviewing performance, allocating funds, providing technical support, following up agreed/corrective actions…)?
- The UNIDO HQ and Filed Office based management, coordination, monitoring, quality control and technical inputs have been efficient, timely and effective (problems identified timely and accurately; quality support provided timely and effectively; right staffing levels, continuity, skill mix and frequency of field visits…)?
- The national management and overall coordination mechanisms were efficient and effective?
- Did each partner have specific roles and responsibilities from the beginning till the end?
- Did each partner fulfil its role and responsibilities (e.g. providing strategic support, monitoring and reviewing performance, allocating funds, providing technical support, following up agreed/corrective actions…)?
- Were the UNIDO HQ based management, coordination, quality control and technical inputs efficient, timely and effective (problems identified timely and accurately; quality support provided timely and effectively; right staffing levels, continuity, skill mix and frequency of field visits…)?

J. Assessment of gender mainstreaming

The evaluation will consider, but need not be limited to, the following issues that may have affected gender mainstreaming in the project:

To which extent were socioeconomic benefits delivered by the project at the national and local levels, including consideration of gender dimensions?

K. Procurement issues

The following evaluation questions that will feed in the Thematic Evaluation on Procurement have been developed and would be included as applicable in all projects (for reference, please see Annex 7 of the ToR: UNIDO Procurement Process):

- To what extent does the process provide adequate treatment to different types of procurement (e.g. by value, by category, by exception…)
- Was the procurement timely? How long the procurement process takes (e.g. by value, by category, by exception…)
- Did the good/item(s) arrive as planned or scheduled? If no, how long were the times gained or delays. If delay, what was the reason(s)?
- Were the procured good(s) acquired at a reasonable price?
- To what extent were the procured goods of the expected/needed quality and quantity?
- Were the transportation costs reasonable and within budget. If no, pleased elaborate.
- Was the freight forwarding timely and within budget?. If no, pleased elaborate.
- Who was responsible for the customs clearance? UNIDO FO? UNDP? Government? Other?
- Was the customs clearance handled professionally and in a timely manner? How many days did it take?

- How long time did it take to get approval from the government on import duty exemption?
- Which were the main bottlenecks / issues in the procurement process?
- Which good practices have been identified?
- To what extent roles and responsibilities of the different stakeholders in the different procurement stages are established, adequate and clear?
- To what extent there is an adequate segregation of duties across the procurement process and between the different roles and stakeholders?

VII. Reporting

Inception report

This terms of reference provides some information on the evaluation methodology but this should not be regarded as exhaustive. After reviewing the project documentation and initial interviews with the project manager the International Evaluation Consultant will prepare, in collaboration with the national consultant, a short inception report that will operationalize the ToR relating to the evaluation questions and provide information on what type of and how the evidence will be collected (methodology). The Inception Report will focus on the following elements: preliminary project theory model(s); elaboration of evaluation methodology including quantitative and qualitative approaches through an evaluation framework ("evaluation matrix"); division of work between the International Evaluation Consultant and National Consultant; mission plan, including places to be visited, people to be interviewed and possible surveys to be conducted and a debriefing and reporting timetable[7].

Evaluation report format and review procedures

The draft report will be delivered to UNIDO EVA (the suggested report outline is in Annex 1) and circulated to UNIDO staff and national stakeholders associated with the project for factual validation and comments. Any comments or responses, or feedback on any errors of fact to the draft report provided by the stakeholders will be sent to the Project Manager for collation and onward transmission to the project evaluation team who will be advised of any necessary revisions. On the basis of this feedback, and taking into consideration the comments received, the evaluation team will prepare the final version of the mid-term review report.

The evaluation team will present its preliminary findings to the local stakeholders at the end of the field visit and take into account their feed-back in preparing the mid-term review report. A presentation of preliminary findings will take place in Nigeria and at HQ after the field mission.

The mid-term review report should be brief, to the point and easy to understand. It must explain the purpose of the review, exactly what was evaluated, and the methods used. The report must highlight any methodological limitations, identify key concerns and present evidence-based findings, consequent conclusions, recommendations and lessons. The report should provide information on when the MTR took place, the places visited, who was involved and be presented in a way that makes the information accessible and comprehensible. The report should include an executive summary that encapsulates the essence of the information contained in the report to facilitate dissemination and distillation of lessons.

[7] The evaluator will be provided with a Guide on how to prepare an evaluation inception report prepared by the UNIDO Office for Independent Evaluation.

Findings, conclusions and recommendations should be presented in a complete, logical and balanced manner. The MTR report shall be written in English and follow the outline given in Annex 1.

Evaluation Work Plan

The "Evaluation Work Plan" includes the following main products:

Desk review, briefing by project manager and development of methodology: Following the receipt of all relevant documents, and consultation with the Project Manager about the documentation, including reaching an agreement on the Methodology, the desk review could be completed.

Inception report: At the time for departure to the field mission, the complete gamete of received materials have been reviewed and consolidated into the Inception report.

Field mission: The principal responsibility for managing this evaluation lies with UNIDO. It will be responsible for liaising with the project team to set up the stakeholder interviews, arrange the field missions, coordinate with the Government. At the end of the field mission, there will be a presentation of preliminary findings to the key stakeholders in the country where the project was implemented.

Preliminary findings from the field mission: Following the field mission, the main findings, conclusions and recommendations would be prepared and presented in the field and at UNIDO Headquarters.

A draft Mid-term review report will be forwarded electronically to the Project Manager, who will forward the same to the Office for Independent Evaluation and circulated to main stakeholders.

A final Mid-term review report will incorporate comments received.

VIII. Quality assurance

The Project Manager (PM) will be responsible for managing the MTR, preparing the terms of reference (TOR) and the job description (JD) of the evaluation consultant(s) on the basis of guidance of UNIDO's Office for Independent Evaluation (ODG/EVA). The PM will forward drafts and final reports to ODG/EVA for review, distribute drafts and final reports to stakeholders (upon review by ODG/EVA), and organize presentations of preliminary review findings which serve to generate feedback on and discussion of review findings and recommendations at UNIDO HQ. Finally, the PM will be responsible for the submission of the final Mid-term review report.

Annex 1 - Outline of an in-depth project evaluation report

Executive summary

- Must provide a synopsis of the storyline which includes the main evaluation findings and recommendations
- Must present strengths and weaknesses of the project
- Must be self-explanatory and should be 3-4 pages in length

I. Evaluation objectives, methodology and process

- Information on the evaluation: why, when, by whom, etc.
- Scope and objectives of the evaluation, main questions to be addressed
- Information sources and availability of information
- Methodological remarks, limitations encountered and validity of the findings

II. Countries and project background

- Brief countries context: an overview of the economy, the environment, institutional development, demographic and other data of relevance to the project
- Sector-specific issues of concern to the project[8] and important developments during the project implementation period
- Project summary:
  - Fact sheet of the project: including project objectives and structure, donors and counterparts, project timing and duration, project costs and co-financing
  - Brief description including history and previous cooperation
  - Project implementation arrangements and implementation modalities, institutions involved, major changes to project implementation
  - Positioning of the UNIDO project (other initiatives of government, other donors, private sector, etc.)
  - Counterpart organization(s)

III. Project assessment

This is the key chapter of the report and should address all evaluation criteria and questions outlined in the TOR (see section VI Project Evaluation Parameters). Assessment must be based on factual evidence collected and analyzed from different sources. The evaluators' assessment can be broken into the following sections:

A. Design
B. Relevance (Report on the relevance of project towards countries and beneficiaries)
C. Effectiveness (The extent to which the development intervention's objectives and deliverables were achieved, or are expected to be achieved, taking into account their relative importance)
D. Efficiency (Report on the overall cost-benefit of the project and partner Countries contribution to the achievement of project objectives)
E. Sustainability of Project Outcomes (Report on the risks and vulnerability of the project, considering the likely effects of sociopolitical and institutional changes in partner countries, and its impact on continuation of benefits after the GEF project ends, specifically the financial, sociopolitical, institutional framework and governance, and environmental risks)
F. Assessment of monitoring and evaluation systems (Report on M&E design, M&E plan implementation, and Budgeting and funding for M&E activities)

[8] Explicit and implicit assumptions in the logical framework of the project can provide insights into key-issues of concern (e.g. relevant legislation, enforcement capacities, government initiatives, etc.)

G. Monitoring of long-term changes
H. Assessment of processes affecting achievement of project results (Report on preparation and readiness / quality at entry, country ownership, stakeholder involvement, financial planning, UNIDO support, cofinancing and project outcomes and sustainability, delays of project outcomes and sustainability, and implementation approach)
I. Project coordination and management (Report project management conditions and achievements, and partner countries commitment)
J. Gender mainstreaming
K. Procurement issues

At the end of this chapter, an overall project achievement rating should be developed as required in Annex 2. The overall rating table required by the GEF should be presented here.

IV. Conclusions, recommendations and lessons learned

This chapter can be divided into three sections:

A. Conclusions

This section should include a storyline of the main review conclusions related to the project's achievements and shortfalls. It is important to avoid providing a summary based on each and every evaluation criterion. The main conclusions should be cross-referenced to relevant sections of the MTR report.

B. Recommendations

This section should be succinct and contain few key recommendations. They should:
- be based on review findings
- realistic and feasible within a project context
- indicate institution(s) responsible for implementation (addressed to a specific officer, group or entity who can act on it) and have a proposed timeline for implementation if possible
- be commensurate with the available capacities of project team and partners
- take resource requirements into account.

Recommendations should be structured by addressees:

- UNIDO
- Government and/or Counterpart Organizations
- Donor

C. Lessons learned

- Lessons learned must be of wider applicability beyond the evaluated project but must be based on findings and conclusions of the MTR
- For each lesson the context from which they are derived should be briefly stated

Annexes should include the MTR TOR, list of interviewees, documents reviewed, a summary of project identification and financial data, and other detailed quantitative information. Dissident views or management responses to the MTR findings may later be appended in an annex.

Annex 2 - Overall ratings table

Criterion	Evaluator's Summary Comments	Evaluator's Rating
Attainment of project objectives and results (overall rating) **Sub criteria (below)**		
Effectiveness		
Relevance		
Efficiency		
Sustainability of Project outcomes (overall rating) Sub criteria (below)		
Financial risks		
Sociopolitical risks		
Institutional framework and governance risks		
Environmental risks		
Monitoring and Evaluation (overall rating) Sub criteria (below)		
M&E Design		
M&E Plan Implementation (use for adaptive management)		
Budgeting and Funding for M&E activities		
UNIDO specific ratings		
Quality at entry / Preparation and readiness		
Implementation approach		
UNIDO Supervision and backstopping		
Overall Rating		

RATING OF PROJECT OBJECTIVES AND RESULTS

Highly Satisfactory (HS): The project had no shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Satisfactory (S): The project had minor shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Moderately Satisfactory (MS): The project had moderate shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Moderately Unsatisfactory (MU): The project had significant shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Unsatisfactory (U) The project had major shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Highly Unsatisfactory (HU): The project had severe shortcomings in the achievement of its objectives, in terms of relevance, effectiveness or efficiency.

Please note: Relevance and effectiveness will be considered as critical criteria. The overall rating of the project for achievement of objectives and results **may not be higher** than the lowest rating on either of these two criteria. Thus, to have an overall satisfactory rating for outcomes a project must have at least satisfactory ratings on both relevance and effectiveness.

RATINGS ON SUSTAINABILITY

Sustainability will be understood as the probability of continued long-term outcomes and impacts after the GEF project funding ends. The MTR will identify and assess the key conditions or factors that are likely to contribute or undermine the persistence of benefits beyond project completion. Some of these factors might be outcomes of the project, i.e. stronger institutional capacities, legal frameworks, socio-economic incentives /or public awareness. Other factors will include contextual circumstances or developments that are not outcomes of the project but that are relevant to the sustainability of outcomes.

Rating system for sustainability sub-criteria

On each of the dimensions of sustainability of the project outcomes will be rated as follows.

Likely (L): There are no risks affecting this dimension of sustainability.

Moderately Likely (ML). There are moderate risks that affect this dimension of sustainability.

Moderately Unlikely (MU): There are significant risks that affect this dimension of sustainability.

Unlikely (U): There are severe risks that affect this dimension of sustainability.

All the risk dimensions of sustainability are critical. Therefore, overall rating for sustainability will not be higher than the rating of the dimension with lowest ratings. For example, if a project has an Unlikely rating in either of the dimensions then its overall rating cannot be higher than Unlikely, regardless of whether higher ratings in other dimensions of sustainability produce a higher average.

RATINGS OF PROJECT M&E

Monitoring is a continuing function that uses systematic collection of data on specified indicators to provide management and the main stakeholders of an ongoing project with indications of the extent of progress and achievement of objectives and progress in the use of allocated funds. Evaluation is the systematic and objective assessment of an on-going or

completed project, its design, implementation and results. Project evaluation may involve the definition of appropriate standards, the examination of performance against those standards, and an assessment of actual and expected results.

The Project monitoring and evaluation system will be rated on 'M&E Design', 'M&E Plan Implementation' and 'Budgeting and Funding for M&E activities' as follows:

Highly Satisfactory (HS): There were no shortcomings in the project M&E system.

Satisfactory(S): There were minor shortcomings in the project M&E system.

Moderately Satisfactory (MS): There were moderate shortcomings in the project M&E system.

Moderately Unsatisfactory (MU): There were significant shortcomings in the project M&E system.

Unsatisfactory (U): There were major shortcomings in the project M&E system.

Highly Unsatisfactory (HU): The Project had no M&E system.

"M&E plan implementation" will be considered a critical parameter for the overall assessment of the M&E system. The overall rating for the M&E systems will not be higher than the rating on "M&E plan implementation."

All other ratings will be on the GEF six point scale:

HS	= Highly Satisfactory	Excellent
S	= Satisfactory	Well above average
MS	= Moderately Satisfactory	Average
MU	= Moderately Unsatisfactory	Below Average
U	= Unsatisfactory	Poor
HU	= Highly Unsatisfactory	Very poor (Appalling)

Annex 3 - GEF Minimum requirements for M&E[9]

Minimum requirement 1: Project design of M&E

All projects will include a concrete and fully budgeted monitoring and evaluation plan by the time of work program entry for full-sized projects and CEO approval for medium-sized projects. This monitoring and evaluation plan will contain as a minimum:

SMART indicators for project implementation, or, if no indicators are identified, an alternative plan for monitoring that will deliver reliable and valid information to management;

SMART indicators for results (outcomes and, if applicable, impacts), and, where appropriate, indicators identified at the corporate level;

Baseline for the project, with a description of the problem to be addressed, with indicator data, or, if major baseline indicators are not identified, an alternative plan for addressing this within one year of implementation;

Identification of reviews and evaluations that will be undertaken, such as mid-term reviews or evaluations of activities; and

Organizational set-up and budgets for monitoring and evaluation.

Minimum requirement 2: Application of project M&E

Project monitoring and supervision will include implementation of the M&E plan, comprising:

SMART indicators for implementation are actively used, or if not, a reasonable explanation is provided;

SMART indicators for results are actively used, or if not, a reasonable explanation is provided;

The baseline for the project is fully established and data compiled to review progress reviews, and evaluations are undertaken as planned; and

The organizational set-up for M&E is operational and budgets are spent as planned.

[9] http://www.thegef.org/gef/sites/thegef.org/files/documents/ME_Policy_2010.pdf

Annex 4 – Required project identification and financial data

The evaluation report should provide information on project identification, time frame, actual expenditures, and co-financing in the following format, which is modeled after the project identification form (PIF).

I. Project general information:

Project Title	
GEF ID Number	
UNIDO ID (SAP Number)	
Region	
Country(ies)	
GEF Focal Area and Operational Program:	
Co-Implementing Agency(ies)	
GEF Agencies (Implementing Agency)	
Project Executing Partners	
Project Size (FSP, MSP, EA)	
Project CEO Endorsement/Approval Date	
Project Implementation Start Date (PAD Issuance Date)	
Original Expected Implementation End Date (indicated in CEO Endorsement/Approval document)	
Revised Expected Implementation End Date (if any)	
Project Duration (Months)	
GEF Grant (USD)	
GEF PPG (USD) (if any)	
Co-financing (USD) at CEO Endorsement	
Total Project Cost (USD) (GEF Grant + Co-financing at CEO Endorsement)	
Agency Fee (USD)	

II. Dates

Milestone	Expected Date	Actual Date
Project CEO Endorsement/Approval Date		
Project Implementation Start Date (PAD Issuance Date)		
Original Expected Implementation End Date (indicated in CEO Endorsement/Approval document)		
Revised Expected Implementation End Date (if any)		
Mid-term evaluation completion		
Planned Tracking Tool Date		

III. Project framework

Project Component	Activity Type	GEF Financing (in $)		Cofinancing (in $)	
		Approved	Actual	Promised	Actual
1.					
2.					
3.					
4.					
5.					
6. Project Management					
Total					

Activity types are:

Experts, researches hired technical assistance, Workshop, Meetings or experts consultation scientific and technical analysis.

Promised co-financing refers to the amount indicated on endorsement/approval.

IV. Co-financing

		Project preparation		Project implementation		Total	
Source of co-financing	Type	Expected	Actual	Expected	Actual	Expected	Actual
Host gov't contribution							
GEF Agency (ies)							
Bilateral aid agency(ies)							
Multilateral agency(ies)							
Private sector							
NGO							
Other							
Total co-financing							

Expected amounts are those submitted by the GEF Agencies in the original project appraisal document. Co-financing types are grant, soft loan, hard loan, guarantee, in kind, or cash.

Annex 5 – ToR - Job descriptions

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

TERMS OF REFERENCE FOR PERSONNEL UNDER INDIVIDUAL SERVICE AGREEMENT (ISA)

Title:	**International Evaluation Consultant (Team leader)**
Main Duty Station and Location:	**Home-based**
Mission/s to:	**Abuja, Nigeria with travel to Ikwo, Ebonyi State, and Vienna, Austria**
Start of Contract (EOD):	**1 November 2014**
End of Contract (COB):	**31 January 2015**
Number of Working Days:	**21**

ORGANIZATIONAL CONTEXT

The Office for Independent Evaluation is responsible for the independent evaluation function of UNIDO. It supports learning, continuous improvement and accountability, and provides factual information about result and practices that feed into the programmatic and strategic decision-making processes. Evaluation is an assessment, as systematic and impartial as possible, of a programme, a project or a theme. Independent evaluations provide evidence-based information that is credible, reliable and useful, enabling the timely incorporation of findings, recommendations and lessons learned into the decision-making processes at organization-wide, programme and project level. The Office for Independent Evaluation is guided by the UNIDO Evaluation Policy, which is aligned to the norms and standards for evaluation in the UN system.

PROJECT CONTEXT

The consultant will evaluate the projects according to the Terms of Reference. S/he will act as leader of the evaluation team and will be responsible for preparing the draft and final evaluation report. S/he will perform the following tasks:

MAIN DUTIES	**Concrete/ measurable Outputs to be achieved**	**Expected duration**	**Location**
Review project documentation and relevant country background information (national policies and strategies, UN strategies and general economic data…); determine key data to collect in the field and prepare key instruments (questionnaires, logic models…) to collect these data through interviews and/or surveys during and prior to the field missions Assess the adequacy of legislative and regulatory framework in Nigeria	List of detailed evaluation questions to be clarified; questionnaires/ interview guide; logic models; list of key data to collect, draft list of stakeholders to interview during the field missions Brief assessment of the adequacy of the country's legislative and regulatory framework	3 days	Home-based
Briefing with the UNIDO Office for Independent Evaluation, project managers and other key stakeholders at HQ Preparation of the Inception Report	Interview notes, detailed evaluation schedule and list of stakeholders to interview during the field missions Division of evaluation tasks with the National Consultant Inception Report	1 day	Home-based (telephone interviews)
Conduct field mission	Presentations of the evaluation's initial findings, draft conclusions and recommendations to stakeholders in the country at the end of the missions. Agreement with the National Consultant on the structure and content of the evaluation report and the distribution of writing tasks	7 days (including travel days)	Nigeria
Present overall findings and recommendations to the stakeholders at UNIDO HQ (incl. travel)	Presentation slides, feedback from stakeholders obtained and discussed	3 days	Vienna, Austria, UNIDO HQs
Prepare the evaluation report according to TOR Coordinate the inputs from the National Consultant and combine with her/his own inputs into the draft evaluation report	Draft evaluation report	5 days	Home-based
Revise the draft project evaluation reports based on comments from UNIDO Office for Independent Evaluation and stakeholders and edit the language and form of the final version according to UNIDO standards	Final evaluation report	2 days	Home-based
Total		**21 days**	

REQUIRED COMPETENCIES

Core values:
1. Integrity
2. Professionalism
3. Respect for diversity

Core competencies:
1. Results orientation and accountability
2. Planning and organizing
3. Communication and trust
4. Team orientation
5. Client orientation
6. Organizational development and innovation

Managerial competencies (as applicable):
1. Strategy and direction
2. Managing people and performance
3. Judgement and decision making
4. Conflict resolution

MINIMUM ORGANIZATIONAL REQUIREMENTS

Education: Advanced university degree in environmental science, engineering or other relevant discipline like developmental studies with a specialization in renewable energies, industrial energy efficiency and/or climate change.

Technical and functional experience:
A minimum of ten years practical experience in the field of environment and energy, including evaluation experience at the international level involving technical cooperation in developing countries. Exposure to the needs, conditions and problems in developing countries.

Languages: Fluency in written and spoken English is required.

Absence of conflict of interest:
According to UNIDO rules, the consultant must not have been involved in the design and/or implementation, supervision and coordination of and/or have benefited from the programme/project (or theme) under evaluation. The consultant will be requested to sign a declaration that none of the above situations exists and that the consultants will not seek assignments with the manager/s in charge of the project before the completion of her/his contract with the Office for Independent Evaluation.

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

TERMS OF REFERENCE FOR PERSONNEL UNDER INDIVIDUAL SERVICE AGREEMENT (ISA)

Title:	**National Evaluation Consultant**
Main Duty Station and Location:	**Home-based**
Mission/s to:	**Abuja, Nigeria with travel to Ikwo, Ebonyi State**
Start of Contract (EOD):	**1 November 2014**
End of Contract (COB):	**31 January 2015**
Number of Working Days:	**21**

ORGANIZATIONAL CONTEXT

The Office for Independent Evaluation is responsible for the independent evaluation function of UNIDO. It supports learning, continuous improvement and accountability, and provides factual information about result and practices that feed into the programmatic and strategic decision-making processes. Evaluation is an assessment, as systematic and impartial as possible, of a programme, a project or a theme. Independent evaluations provide evidence-based information that is credible, reliable and useful, enabling the timely incorporation of findings, recommendations and lessons learned into the decision-making processes at organization-wide, programme and project level. The Office for Independent Evaluation is guided by the UNIDO Evaluation Policy, which is aligned to the norms and standards for evaluation in the UN system.

PROJECT CONTEXT

The consultant will evaluate the projects according to the Terms of Reference under the leadership of the Team Leader (International Evaluation Consultant). S/he will act as leader of the evaluation team and will be responsible for preparing the draft and final evaluation report. S/he will perform the following tasks:

MAIN DUTIES	**Concrete/ measurable Outputs to be achieved**	**Expected duration**	**Location**
Review project documentation and relevant country background information (national policies and strategies, UN strategies and general economic data…); in cooperation with Team Leader: determine key data to collect in the field and prepare key instruments (questionnaires, logic models…) to collect these data through interviews and/or surveys during and prior to the field missions Assess the adequacy of legislative and regulatory framework in Nigeria	List of detailed evaluation questions to be clarified; questionnaires/ interview guide; logic models; list of key data to collect, draft list of stakeholders to interview during the field missions Brief assessment of the adequacy of the country's legislative and regulatory framework	3 days	Home-based
Briefing with the evaluation team leader, UNIDO project managers and other key stakeholders Assist in setting up the evaluation mission agenda, coordinating meetings and site visits Assisting the Team leader in the preparation of the Inception Report	Interview notes, detailed evaluation schedule and list of stakeholders to interview during the field missions Division of evaluation tasks with the National Consultant Inception Report	3 days	Home-based (telephone interviews)
Conduct field mission	Presentations of the evaluation's initial findings, draft conclusions and recommendations to stakeholders in the country at the end of the mission. Agreement with the International Consultant and Team Leader on the structure and content of the evaluation report and the distribution of writing tasks	7 days (including travel days)	Nigeria
Prepare inputs to the evaluation report according to TOR and as agreed with Team Leader	Draft evaluation report	6 days	Home-based
Revise the draft project evaluation reports based on comments from UNIDO Office for Independent Evaluation and stakeholders and edit the language and form of the final version according to UNIDO standards	Final evaluation report	2 days	Home-based
Total		**21 days**	

REQUIRED COMPETENCIES

Core values:
1. Integrity
2. Professionalism
3. Respect for diversity

Core competencies:
1. Results orientation and accountability
2. Planning and organizing
3. Communication and trust
4. Team orientation
5. Client orientation
6. Organizational development and innovation

Managerial competencies (as applicable):
1. Strategy and direction
2. Managing people and performance
3. Judgement and decision making
4. Conflict resolution

MINIMUM ORGANIZATIONAL REQUIREMENTS

Education: Advanced university degree in environmental science, engineering or other relevant discipline like developmental studies with a specialization in renewable energies, industrial energy efficiency and/or climate change.

Technical and functional experience:
A minimum of five years practical experience in the field of environment and energy, including evaluation experience at the international level involving technical cooperation in developing countries. Exposure to the needs, conditions and problems in developing countries. Familiarity with the institutional context of the project in Ministry of Energy, Ministry of Environment and Energy Commission of Nigeria. is desirable.

Languages: Fluency in written and spoken English is required.

Absence of conflict of interest:
According to UNIDO rules, the consultant must not have been involved in the design and/or implementation, supervision and coordination of and/or have benefited from the programme/project (or theme) under evaluation. The consultant will be requested to sign a declaration that none of the above situations exists and that the consultants will not seek assignments with the manager/s in charge of the project before the completion of her/his contract with the Office for Independent Evaluation.

Annex 6 –Project Result Framework

Project Strategy		**Objectively verifiable indicators**				
		Indicator (quantified and time-bound)	**Baseline**	**Target**	**Source of verification**	**Risks and Assumptions**
Goal	To reduce and avoid GHG emission from the energy sector of Nigeria.	Incremental CO_2 emission reduction.	CO_2 emission due to diesel based power generation.	1. 5 MW of biomass based mini-grid capacity added during the project period.	1. Physical verification of projects in operation. 2. End of project survey.	Continuous support of all participating organizations, State Government and project investors.
Objective of the project	To promote renewable energy (biomass) based mini-grid as an alternative to diesel based energy generation systems in Nigeria	1. 5 MW of biomass based power generation. 2. Investments by financial institutions to biomass projects.	1. No biomass based power plant and mini-grid exists in Nigeria. 2. No practically workable support schemes available in Nigeria for the promotion of biomass projects.	1. 5 MW of biomass power plant capacity established. 2. Policy, regulatory regime established. 3. Replication potential of biomass projects identified.	1. Physical verification of Implemented project. 2. End of project survey.	1. Sustained government / investor support to the agreed project activities. 2. Commitment of Government agencies in building capacity and making policy changes.

Project Strategy		Objectively verifiable indicators				
		Indicator (quantified and time-bound)	**Baseline**	**Target**	**Source of verification**	**Risks and Assumptions**
Outcome 1	Preparatory works completed for facilitating replication in the identified potential sites.	Feasibility study, business plans and other power plant support/development activities and reports available for the potential replication sites.	No preparatory works for the replication of the biomass power plants have been taken	Techno-economic feasibility studies, business plans and other essential reports for the three identified sites.	Project reports.	Sustained Government support.
Project Component 1- Development of techno-economic feasibility studies and business plans for identified potential sites to facilitate replication.						
Output 1.1	Techno-economic feasibility studies and business plans developed for the 3 identified potential sites to facilitate replication.	1. Techno-economic feasibility studies and business plans for the identified sites 2. Reports on existing tax schemes, BoI privileges, required licenses and permits, environmental regulations, proposed government schemes, meteorological, seismic data and other relevant data for the	1. Techno-economic feasibility studies and business plans not available for the identified sites. 2. Very little information available on existing set-up and schemes	1. 3 techno-economic feasibility studies and business plans developed for the identified sites. 2. Other compiled reports	Project reports.	Sustained Government support.

Project Strategy		Objectively verifiable indicators				
		Indicator (quantified and time-bound)	**Baseline**	**Target**	**Source of verification**	**Risks and Assumptions**
		implementation for the biomass project feasibility study sites				
Outcome 2	Acceptance by stakeholders on the technical and financial viability of selected site for setting up the biomass based mini-grid for rural electrification.	Investors ready to invest and agreement signed for implementing the biomass based mini-grid project.	Investors not ready to invest/develop biomass projects in Nigeria due to risks and lack of knowledge.	Investors are ready to invest in the biomass based mini-grid project identified for implementation.	Shareholder agreement.	Investors' support and Government support.
Project Component 2 - Demonstration of techno-economic viability of biomass based mini-grid.						
Output 2.1	A biomass based power plant of 5 MW installed capacity commissioned in the selected site along with mini-grid.	1. A biomass mini-grid of capacity 5 MW is established. 2. Electricity usage by the consumers. 3. CO_2 emission reduction from biomass electricity usage.	1. Biomass based mini-grid not in place. 2. Diesel based power generation in the absence of biomass based electricity. 3. No biomass electricity available.	1. A biomass based power plant including mini-grid is in operation. 2. 25,000 t CO_2 emission reduction annually from biomass electricity usage. 3. Above 31,000 MWh of annual electricity supply to various	1. Physical verification of biomass power plant project. 2. Records of biomass power plant 3. UNIDO expert report	Sustained Government / investor support to agreed project activities.

Project Strategy		Objectively verifiable indicators				
		Indicator (quantified and time-bound)	**Baseline**	**Target**	**Source of verification**	**Risks and Assumptions**
				users from biomass mini-grid.		
Output 2.2	Capacity on biomass power plant operation and maintenance as well as mini-grid management developed	Trained personals in place for operation and maintenance of the biomass power plant including management of mini-grid.	No local capacity to operate, maintain power plant and mini-grid.	Number of operators identified and trained for the operation and maintenance of power plant and management of mini-grid.	1. Physical verification of operation and maintenance personal in the power plant. 2. Trainings given to operation and maintenance staff.	Sustained investor support to agreed project activities.
Output 2.3	The mini-grid independently monitored, evaluated, lessons learnt and information widely distributed	1. Plant performance study reports. 2. Full scale demonstration site visits and seminars. 3. Dissemination leaflets. 4. Website.	Biomass based mini-grid projects not in place to study the performance and to learn the lessons from.	1. Performance assessment report 2. Full scale demonstration site visits and seminar 3. Website 4. Project leaflet	Performance monitoring report, site visit/seminar, programme evaluation form, seminar material, leaflet, website.	Sustained investor support to visit the project while in operation and data collection.
Outcome 3	Conducive financing and policy environment for promoting investments in rural	Favourable policy and investment conditions for biomass mini-grid projects.	The existing policy, financing, investment facilities are not adequate and institutional capacity for biomass mini-	1. Favourable policy and feed-in-tariff schemes are in place. 2. More and more financing institutions	1. End of project survey 2. Final evaluation	Sustained government support to agreed project activities.

Project Strategy		Objectively verifiable indicators				
		Indicator (quantified and time-bound)	**Baseline**	**Target**	**Source of verification**	**Risks and Assumptions**
	mini-grids in place.		grid projects are limited.	and investors ready to finance/invest. 3. Increased local capacity of institutions.		
Project Component 3 - Strengthening of financial and policy environment to support RE based mini-grid systems						
Output 3.1	FiT for biomass power in place.	FiT for biomass power plant exporting electricity to national grid in place.	There is no FiT specific to the biomass projects in Nigeria.	FiT is in place for the biomass power projects.	1. End of project survey 2. Final evaluation	Sustained government support.
Output 3.2	Appropriate financing facility developed for RE related projects.	More supportive financing facility in place for RE related projects including biomass power projects.	Financing facility not in place to fund biomass mini-grid projects.	Exclusive financing facility available for RE projects including biomass projects.	1. End of project survey. 2. Final evaluation.	Support from commercial and development banks.
Outcome 4	Capacity of local planners, institutions and experts for RE based mini-grid enhanced.	1. Number of local planners, institutions and experts for RE based mini-grids trained. 2. Establishment of one-stop information centre for biomass/renewable	1. Number of local planners, institutions and experts do not have capacity to develop and implement biomass power plant mini-grids.	1. More than 100 persons trained. 2. Establishment and operation of the centre	1. No. of persons trained. 2. Training material 3. Training evaluation report	Sustained support from Government, local planners, institutions and experts for RE based mini-grids.

Project Strategy		Objectively verifiable indicators				
		Indicator (quantified and time-bound)	**Baseline**	**Target**	**Source of verification**	**Risks and Assumptions**
		energy	2. No such centralized information centre available			
Project Component 4 - Capacity development for replication of RE mini-grid technologies.						
Output 4.1	Local capacity in designing mini-grid developed	Number of local companies trained on mini-grid design.	Lack of knowledge and experience in mini-grid design for biomass projects.	One training programme for mini-grid design conducted for local companies.	1. No. of persons trained. 2. Training material 3. Training evaluation report	Interest of local electrical companies.
Output 4.2	Experts, planners, and institutions are trained in developing biomass based energy and mini-grid systems	1. Biomass project development and implementation training programme conducted 2. No. of participants benefited from the training 3. Biomass mini-grid project development guide prepared	Lack of knowledge and experience in the development of biomass mini-grid projects in Nigeria.	1. Two biomass project development trainings conducted 2. More than 60 participants trained 3. Biomass mini-grid project development guide prepared. 4.	1. No. of persons trained. 2. Training material 3. Training evaluation report	Sustained support from Government, local planners, institutions and experts for RE based mini-grids.
Output 4.3	Capacity of RE	Number of RE related	Financing	Minimum of 5 financing	1. No. of persons	Sustained support

Project Strategy		Objectively verifiable indicators				
		Indicator (quantified and time-bound)	**Baseline**	**Target**	**Source of verification**	**Risks and Assumptions**
	related and financing institutions strengthened.	and financial institutions trained.	institutions lack knowledge on assessment and evaluation of biomass based mini-grid projects. RE institutions lack knowledge and skill in biomass based mini-grids.	institutions and 2 RE related institutions trained.	trained. 2. Training material 3. Training evaluation report	from Government renewable energy institutions and financial institutions support..
Output 4.4	Capacity of local engineering firms and O&M companies developed in operation and maintenance of biomass power plants and mini-grid systems.	Number of local engineering companies trained in operation and maintenance services.	There is no or very limited local capacity for operation and maintenance of biomass Power plants in Nigeria.	More than 2 local engineering firms ready to provide operation and maintenance service	1. No. of persons trained. 2. Training material 3. Training evaluation report	Support of local engineering companies.

Annex 7 – UNIDO Procurement process

UNIDO Procurement Process
-- Generic Approach and Assessment Framework –

1. Introduction

This document outlines an approach and encompasses a framework for the assessment of UNIDO procurement processes, to be included as part of country evaluations as well as in technical cooperation (TC) projects/programmes evaluations.

The procurement process assessment will review in a systematic manner the various aspects and stages of the procurement process being a key aspect of the technical cooperation (TC) delivery. These reviews aim to diagnose and identify areas of strength as well as where there is a need for improvement and lessons.

The framework will also serve as the basis for the "thematic evaluation of the procurement process efficiency" to be conducted in 2015 as part of the ODG/EVA work programme for 2014-15.

2. Background

Procurement is defined as the overall process of acquiring goods, works, and services, and includes all related functions such as planning, forecasting, supply chain management, identification of needs, sourcing and solicitation of offers, preparation and award of contract, as well as contract administration until the final discharge of all obligations as defined in the relevant contract(s). The procurement process covers activities necessary for the purchase, rental, lease or sale of goods, services, and other requirements such as works and property.

Past project and country evaluations commissioned by ODG/EVA raised several issues related to procurement and often efficiency related issues. It also became obvious that there is a shared responsibility in the different stages of the procurement process which includes UNIDO staff, such as project managers, and staff of the procurement unit, government counterparts, suppliers, local partner agencies (i.e. UNDP), customs and transport agencies etc..

In July 2013, a new "UNIDO Procurement Manual" was introduced. This Procurement Manual provides principles, guidance and procedures for the Organization to attain specified standards in the procurement process. The Procurement Manual also establishes that "The principles of fairness, transparency, integrity, economy, efficiency and effectiveness must be applied for all procurement transactions, to be delivered with a high level of professionalism thus justifying UNIDO's involvement in and adding value to the implementation process".

To reduce the risk of error, waste or wrongful acts and the risk of not detecting such problems, no single individual or team controls shall control all key stages of a transaction. Duties and responsibilities shall be assigned systemically to a number of individuals to ensure that effective checks and balances are in place.

In UNIDO, authorities, responsibilities and duties are segregated where incompatible. Related duties shall be subject to regular review and monitoring. Discrepancies, deviations and exceptions are properly regulated in the Financial Regulations and Rules and the Staff Regulations and Rules. Clear segregation of duties is maintained between programme/project management, procurement and supply chain management, risk management, financial management and accounting as well as auditing and internal oversight. Therefore, segregation of duties is an important basic principle of internal control and must be observed throughout the procurement process.

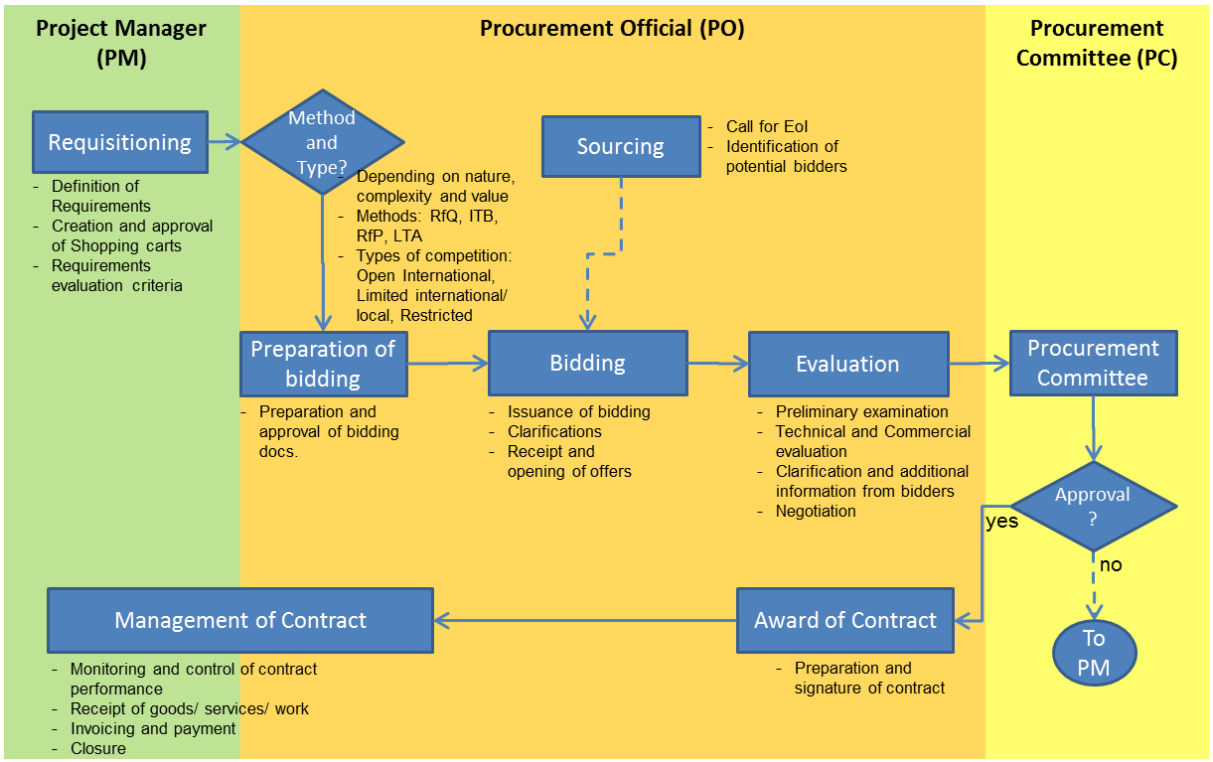
The different stages of the procurement process should be carried out, to the extent possible, by separate officials with the relevant competencies. As a minimum, two officials shall be involved in

carrying out the procurement process. The functions are segregated among the officials belonging to the following functions:

- Procurement Services: For carrying out centralized procurement, including review of technical specifications, terms of reference, and scope of works, market research/surveys, sourcing/solicitation, commercial evaluation of offers, contract award, contract management;
- Substantive Office: For initiating procurement requests on the basis of well formulated technical specifications, terms of reference, scope of works, ensuring availability of funds, technical evaluation of offers; award recommendation; receipt of goods/services; supplier performance evaluation. In respect of decentralized procurement, the segregation of roles occur between the Project Manager/Allotment Holder and his/her respective Line Manager. For Fast Track procurement, the segregate on occurs between the Project Manager/Allotment Holder and Financial Services;
- Financial Services: For processing payments.

Figure 1 presents a preliminary "Procurement Process Map", showing the main stages, stakeholders and their respective roles and responsibilities. During 2014/2015, in preparation for the thematic evaluation of the procurement process in 2015, this process map/ workflow will be further refined and reviewed.

FIGURE 1: UNIDO PROCUREMENT PROCESS MAP



3. Purpose

The purpose of the procurement process assessments is to diagnose and identify areas for possible improvement and to increase UNIDO's learning about strengths and weaknesses in the procurement process. It will also include an assessment of the adequacy of the 'Procurement Manual" as a guiding document.

The review is intended to be useful to managers and staff at UNIDO headquarters and in the field offices (project managers, procurement officers), who are the direct involved in procurement and to UNIDO management.

4. Scope and focus

Procurement process assessments will focus on the efficiency aspects of the procurement process, and hence it will mainly fall under the efficiency evaluation criterion. However, other criteria such as effectiveness will also be considered as needed.

These assessments are expected to be mainstreamed in all UNIDO country and project evaluations to the extent of its applicability in terms of inclusion of relevant procurement related budgets and activities.

A generic evaluation matrix has been developed and is found in Annex B. However questions should be customized for individual projects when needed.

5. Key issues and evaluation questions

Past evaluations and preliminary consultations have highlighted the following aspects or identified the following issues:

- Timeliness. Delays in the delivery of items to end-users.
- Bottlenecks. Points in the process where the process stops or considerably slows down.
- Procurement manual introduced, but still missing subsidiary templates and tools for its proper implementation and full use.
- Heavy workload of the procurement unit and limited resources and increasing "procurement demand"
- Lack of resources for initiating improvement and innovative approaches to procurement (such as Value for Money instead of lowest price only, Sustainable product lifecycle, environmental friendly procurement, etc.)
- The absence of efficiency parameters (procurement KPIs)

On this basis, the following evaluation questions have been developed and would be included as applicable in all project and country evaluations in 2014-2015

- To what extent does the process provide adequate treatment to different types of procurement (e.g. by value, by category, by exception…)
- Was the procurement timely? How long the procurement process takes (e.g. by value, by category, by exception…)
- Did the good/item(s) arrive as planned or scheduled? If no, how long were the times gained or delays. If delay, what was the reason(s)?
- Were the procured good(s) acquired at a reasonable price?
- To what extent were the procured goods of the expected/needed quality and quantity?
- Were the transportation costs reasonable and within budget. If no, pleased elaborate.
- Was the freight forwarding timely and within budget?. If no, pleased elaborate.
- Who was responsible for the customs clearance? UNIDO FO? UNDP? Government? Other?

- Was the customs clearance handled professionally and in a timely manner? How many days did it take?
- How long time did it take to get approval from the government on import duty exemption?
- Which were the main bottlenecks / issues in the procurement process?
- Which good practices have been identified?
- To what extent roles and responsibilities of the different stakeholders in the different procurement stages are established, adequate and clear?
- To what extent there is an adequate segregation of duties across the procurement process and between the different roles and stakeholders?

6. Evaluation method and tools

These assessments will be based on a participatory approach, involving all relevant stakeholders (e.g. process owners, process users and clients).
The evaluation tools to be considered for use during the reviews are:

- **Desk Review**: Policy, Manuals and procedures related to the procurement process. Identification of new approaches being implemented in other UN or international organizations. Findings, recommendations and lessons from UNIDO Evaluation reports.
- **Interviews**: to analyze and discuss specific issues/topics with key process stakeholders
- **Survey to stakeholders**: To measure the satisfaction level and collect expectations, issues from process owners, user and clients
- **Process and Stakeholders Mapping**: To understand and identify the main phases the procurement process and sub-processes; and to identify the perspectives and expectations from the different stakeholders, as well as their respective roles and responsibilities
- **Historical Data analysis from IT procurement systems**: To collect empirical data and identify and measure to the extent possible different performance dimensions of the process, such as timeliness, re-works, complaints, ..)

An evaluation matrix is presented in Annex A, presenting the main questions and data sources to be used in the project and country evaluations, as well as the preliminary questions and data sources for the forthcoming thematic evaluation on Procurement process in 2015.

ANNEX A: Evaluation matrix for the procurement process

Area	Evaluation Question	Indicators[10]	Data Source(s) For Country / Project Evaluations	Additional data Source(s) For Thematic Evaluation of procurement process in 2015.
Timeliness	Was the procurement timely? How long the procurement process takes (e.g. by value, by category, by exception…)	(Overall) Time to Procure (TTP)	Interviews with PMs, Government counterparts and beneficiaries	• Procurement related documents review • SAP/Infobase (queries related to procurement volumes, categories, timing, issues) • Evaluation Reports • Survey to PMs, procurement officers, beneficiaries, field local partners. • Interviews with Procurement officers
	Did the good/item(s) arrive as planned or scheduled? If no, how long were the times gained or delays. If delay, what was the reason(s)?	Time to Delivery (TTD)	Interviews with PM, procurement officers and Beneficiaries	
	Was the freight forwarding timely and within budget? If no, pleased elaborate.			
	Was the customs clearance timely? How many days did it take?		Interviews with PMs, Government counterparts and beneficiaries	
	How long time did it take to get approval from the government on import duty exemption	Time to Government Clearance (TTGC)	Interviews with beneficiaries	
Roles and Responsibilities	To what extent roles and responsibilities of the different stakeholders in the	Level of clarity of roles and responsibilities	• Procurement Manual • Interview with PMs	• Procurement related documents review • Evaluation

[10] These indicators are preliminary proposed here. They will be further defined and piloted during the Thematic Evaluation of UNIDO procurement process planned for 2015.

Area	Evaluation Question	Indicators[10]	Data Source(s) For Country / Project Evaluations	Additional data Source(s) For Thematic Evaluation of procurement process in 2015.
	different procurement stages are established, adequate and clear?			Reports • Survey to PMs, procurement officers, beneficiaries, field local partners. • Interviews with Procurement officers
	To what extent there is an adequate segregation of duties across the procurement process and between the different roles and stakeholders?		• Procurement Manual • Interview with PMs	
	How was responsibility for the customs clearance arranged? UNIDO FO? UNDP? Government? Other?		• Procurement Manual • Interview to PMs • Interviews with local partners	
	To what extent were suppliers delivering products/ services as required?	Level of satisfaction with Suppliers	Interviews with PMs	
Costs	Were the transportation costs reasonable and within budget. If no, pleased elaborate.		Interviews with PMs	• Evaluation Reports • Survey to PMs, procurement officers, beneficiaries, field local partners. • Interviews with Procurement officers
	Were the procured goods/services within the expected/planned costs? If no, please elaborate	Costs vs budget	Interview with PMs	

Area	Evaluation Question	Indicators[10]	Data Source(s) For Country / Project Evaluations	Additional data Source(s) For Thematic Evaluation of procurement process in 2015.
Quality of Products	To what extent the process provides adequate treatment to different types of procurement (e.g. by value, by category, by exception)		Interview with PMs	• Evaluation Reports • Survey to PMs, procurement officers, beneficiaries, field local partners. • Interviews with Procurement officers
	To what extent were the procured goods of the expected/needed quality and quantity?	Level of satisfaction with products/services	• Survey to PMs and beneficiaries • Observation in project site	
Process / workflow	To what extent the procurement process if fit for purpose?	Level of satisfaction with the procurement process	Interviews with PMs, Government counterparts and beneficiaries	• Procurement related documents review • Evaluation Reports • Survey to PMs, procurement officers, beneficiaries, field local partners. • Procurement related documents review • Evaluation Reports • Survey to PMs, procurement officers, beneficiaries, field local partners. • Interviews with Procurement officers
	Which are the main bottlenecks / issues in the procurement process?		Interviews with PMs, Government counterparts and beneficiaries	
	Which part(s) of the procurement process can be streamlined or simplified?		Interview with PMs	

Annex B: List of persons met (interviewees)

S/N	NAME	TITLE/POSTION	NAME OF COMPANY/ ORGANIZATION	PHONE/E-MAIL
1.	Jossy Thomas	Industrial Development Officer	UNIDO Renewable and Rural Energy Unit Energy and Climate Change Branch	j.thomas@unido.org
2.	Michale Mgonja	Auditor/Inspector	UNIDO Office for Internal Oversight Services	m.mgonja@unido.org
3.	Javier Guarnizo	Senior Evaluation Officer	UNIDO Evaluation Group Office of the Director – General	j.guarnizo@unido.org
4.	Edme Koffi	Chief, Africa Bureau LDC Coordinator	UNIDO Africa Bureau	e.koffi@unido.org
5.	Bashir Conde	Programme Management Officer	UNIDO Africa Bureau	b.conde@unido.org
6.	Reuben O. Bamidele	National Programme Officer	UNIDO Nigeria Country Office	r.bamidele@unido.org
7.	Engr. Okon Ekpenyong	Deputy Director	Energy Commission of Nigeria(ECN)	08032920873 ekpenyongokon@yahoo.com
8.	Prof. Eli Jidere Bala	Director General/CEO	Ditto	08033343977
9.	Engr. Emmanuel E. Ezeaputa	Asst. Director	Federal Ministry of Energy	8033073186 nuelezeking@yahoo.com
10.	Mr. Yomi Ladapo	Director PRS/OFP(GEF)	Federal Ministry of Environment	08186201970
11.	Festus O.I. Eguaoje	Asst. Director(GEF)	Ditto	08033343564 Obgbua1968gmail.com
12.	Engr. Yusuf Abdullah	Manager (Distribution')ES&S	NERC	08036275127
13.	Engr. Yusuf Abdusalam	PM(R&D)	Ditto	08032907889 ayusuf@nercng.org
14.	Dr. Ibrahim	Commissioner Engineering Standard & Safety	Ditto	08106807123
15.	Mr. Ben Okah	Hon. Commissioner	Ministry of Public Utility	08033139747
16.	Mr. Felix Mkpumah	Permanent Secretary	Ditto	08027888270
17.	Mr. M. E. Nwobasi	Head of Dept. (Finance & Accounts)	Ditto	0803373457
18.	Engr. Eme Emeka	Project Engineer	UNIDO Ebonyi State	07103799464 Empnf2000@yahoo.com

S/N	NAME	TITLE/POSTION	NAME OF COMPANY/ ORGANIZATION	PHONE/E-MAIL
19.	Engr. Joseph Agwu	Project Engineer	Ditto	0805402618 agwujosepha@gmail.com
20.	Engr. Eze Ephraim	Ditto	Ditto	08036863755 ephraimuwaezuoke@gmail.com
21.	Evang. Chukwuma Elom	State Coordinator	UNIDO Project Ebonyi State	08037791351 ebonyiunido@yahoo.com
22.	Kola Adewale	Group Head Eng & Tech	Bank of Industry	08023124508
23.	Ruseh Oghenekaro	Technical Officer BOI/UNDP Solar Energy Programme	Bank of Industry	08035744466
24.	Toyin Ogunade	PM, CBN Intervention Fund	Bank of Industry	-
25.	Michael Oye	Head SME Funds	Bank of Industry	07026700390

Annex D: Bibliography / Documents reviewed

- Mini grid based renewable energy (biomass) sources to augment rural electrification, Project document, UNIDO, Project of Nigeria
- EPC Contract Agreement, APPL – Isgec, 8th November, 2013
- GEF Steering Meeting report by Commissioner, November 19, 2014
- Co-financing Commitment letter, Federal Ministry of Environment, 3rd November 2010,
- Land allocation letter, Government of Ebonyi State of Nigeria,
- APPL, Shareholders agreement, 19th November, 2010,
- 2012 Project Work Plan,
- 2013 Project Work Plan,
- Techno-economic Studies on Biomass Gasification Power Plants in Nigeria, Second Progress Report, December 2014,
- Techno-economic Studies on Biomass Gasification Power Plants in Nigeria, First Progress Report, September 2014,
- 3rd SC meeting report,
- Review of the Nigerian Feed – in Tariff for Renewable Energy Electricity generation
- Report of the Inception Workshop, 24 August 2012,
- 2nd SC meeting report,
- Nomination of Project Coordination Letter, 3rd October 2012,
- Country's briefing – Nigeria, UNIDO
- Revised country programme of cooperation between the federal Republic of Nigeria and UNIDO, Economic transformation through sustainable and inclusive industrial development and trade of value added products, United Nations Industrial Development Organization, 2013-2016
- Review of the Nigerian Feed – in Tariff for Renewable Energy Electricity generation,
- World bank country overview (http://www.worldbank.org/en/country/nigeria/overview)

Annex E: Project result framework (Source: Project document)

Project Strategy		Objectively verifiable indicators				
		Indicator (quantified and time-bound)	**Baseline**	**Target**	**Source of verification**	**Risks and Assumptions**
Goal	To reduce and avoid GHG emission from the energy sector of Nigeria.	Incremental CO_2 emission reduction.	CO_2 emission due to diesel based power generation.	2. 5 MW of biomass based mini-grid capacity added during the project period.	3. Physical verification of projects in operation. 4. End of project survey.	Continuous support of all participating organizations, State Government and project investors.
Objective of the project	To promote renewable energy (biomass) based mini-grid as an alternative to diesel based energy generation systems in Nigeria	3. 5 MW of biomass based power generation. 4. Investments by financial institutions to biomass projects.	3. No biomass based power plant and mini-grid exists in Nigeria. 4. No practically workable support schemes available in Nigeria for the promotion of biomass projects.	4. 5 MW of biomass power plant capacity established 5. Policy, regulatory regime established 6. Replication potential of biomass projects identified.	3. Physical verification of Implemented project. 4. End of project survey.	3. Sustained government / investor support to the agreed project activities. 4. Commitment of Government agencies in building capacity and making policy changes.
Outcome 1	Preparatory works completed for facilitating replication in the identified potential sites.	Feasibility study, business plans and other power plant support/development activities and reports available for the potential replication sites.	No preparatory works for the replication of the biomass power plants have been taken	Techno-economic feasibility studies, business plans and other essential reports for the three identified sites.	Project reports.	Sustained Government support.

Project Strategy		Objectively verifiable indicators				
		Indicator (quantified and time-bound)	**Baseline**	**Target**	**Source of verification**	**Risks and Assumptions**
Project Component 1- Development of techno-economic feasibility studies and business plans for identified potential sites to facilitate replication.						
Output 1.1	Techno-economic feasibility studies and business plans developed for the 3 identified potential sites to facilitate replication.	3. Techno-economic feasibility studies and business plans for the identified sites 4. Reports on existing tax schemes, BoI privileges, required licenses and permits, environmental regulations, proposed government schemes, meteorological, seismic data and other relevant data for the implementation for the biomass project feasibility study sites	3. Techno-economic feasibility studies and business plans not available for the identified sites. 4. Very little information available on existing set-up and schemes	3. 3 techno-economic feasibility studies and business plans developed for the identified sites. 4. Other compiled reports	Project reports.	Sustained Government support.

Project Strategy		**Objectively verifiable indicators**				
		Indicator (quantified and time-bound)	**Baseline**	**Target**	**Source of verification**	**Risks and Assumptions**
Outcome 2	Acceptance by stakeholders on the technical and financial viability of selected site for setting up the biomass based mini-grid for rural electrification.	Investors ready to invest and agreement signed for implementing the biomass based mini-grid project.	Investors not ready to invest/develop biomass projects in Nigeria due to risks and lack of knowledge.	Investors are ready to invest in the biomass based mini-grid project identified for implementation.	Shareholder agreement.	Investors' support and Government support.
Project Component 2 - Demonstration of techno-economic viability of biomass based mini-grid.						
Output 2.1	A biomass based power plant of 5 MW installed capacity commissioned in the selected site along with mini-grid.	4. A biomass mini-grid of capacity 5 MW is established. 5. Electricity usage by the consumers. 6. CO_2 emission reduction from biomass electricity usage.	4. Biomass based mini-grid not in place. 5. Diesel based power generation in the absence of biomass based electricity. 6. No biomass electricity available.	4. A biomass based power plant including mini-grid is in operation. 5. 25,000 t CO_2 emission reduction annually from biomass electricity usage. 6. Above 31,000 MWh of annual electricity supply to various users from biomass mini-grid.	4. Physical verification of biomass power plant project. 5. Records of biomass power plant 6. UNIDO expert report	Sustained Government / investor support to agreed project activities.

Project Strategy		Objectively verifiable indicators				
		Indicator (quantified and time-bound)	**Baseline**	**Target**	**Source of verification**	**Risks and Assumptions**
Output 2.2	Capacity on biomass power plant operation and maintenance as well as mini-grid management developed	Trained personals in place for operation and maintenance of the biomass power plant including management of mini-grid.	No local capacity to operate, maintain power plant and mini-grid.	Number of operators identified and trained for the operation and maintenance of power plant and management of mini-grid.	3. Physical verification of operation and maintenance personal in the power plant. 4. Trainings given to operation and maintenance staff.	Sustained investor support to agreed project activities.
Output 2.3	The mini-grid independently monitored, evaluated, lessons learnt and information widely distributed	5. Plant performance study reports. 6. Full scale demonstration site visits and seminars. 7. Dissemination leaflets. 8. Website.	Biomass based mini-grid projects not in place to study the performance and to learn the lessons from.	5. Performance assessment report 6. Full scale demonstration site visits and seminar 7. Website 8. Project leaflet	Performance monitoring report, site visit/seminar, programme evaluation form, seminar material, leaflet, website.	Sustained investor support to visit the project while in operation and data collection.
Outcome 3	Conducive financing and policy environment for promoting investments in rural mini-grids in place.	Favourable policy and investment conditions for biomass mini-grid projects.	The existing policy, financing, investment facilities are not adequate and institutional capacity for biomass mini-grid projects are limited.	4. Favourable policy and feed-in-tariff schemes are in place. 5. More and more financing institutions and investors ready to finance/invest. 6. Increased local capacity of institutions.	3. End of project survey 4. Final evaluation	Sustained government support to agreed project activities.

Project Strategy		Objectively verifiable indicators				
		Indicator (quantified and time-bound)	**Baseline**	**Target**	**Source of verification**	**Risks and Assumptions**
Project Component 3 - Strengthening of financial and policy environment to support RE based mini-grid systems						
Output 3.1	FiT for biomass power in place.	FiT for biomass power plant exporting electricity to national grid in place.	There is no FiT specific to the biomass projects in Nigeria.	FiT is in place for the biomass power projects.	3. End of project survey 4. Final evaluation	Sustained government support.
Output 3.2	Appropriate financing facility developed for RE related projects.	More supportive financing facility in place for RE related projects including biomass power projects.	Financing facility not in place to fund biomass mini-grid projects.	Exclusive financing facility available for RE projects including biomass projects.	3. End of project survey. 4. Final evaluation.	Support from commercial and development banks.
Outcome 4	Capacity of local planners, institutions and experts for RE based mini-grid enhanced.	3. Number of local planners, institutions and experts for RE based mini-grids trained. 4. Establishment of one-stop information centre for biomass/ renewable energy	3. Number of local planners, institutions and experts do not have capacity to develop and implement biomass power plant mini-grids. 4. No such centralized information centre available	3. More than 100 persons trained. 4. Establishment and operation of the centre	4. No. of persons trained. 5. Training material 6. Training evaluation report	Sustained support from Government, local planners, institutions and experts for RE based mini-grids.

Project Strategy		Objectively verifiable indicators				
		Indicator (quantified and time-bound)	**Baseline**	**Target**	**Source of verification**	**Risks and Assumptions**
Project Component 4 - Capacity development for replication of RE mini-grid technologies.						
Output 4.1	Local capacity in designing mini-grid developed	Number of local companies trained on mini-grid design.	Lack of knowledge and experience in mini-grid design for biomass projects.	One training programme for mini-grid design conducted for local companies.	4. No. of persons trained. 5. Training material 6. Training evaluation report	Interest of local electrical companies.
Output 4.2	Experts, planners, and institutions are trained in developing biomass based energy and mini-grid systems	4. Biomass project development and implementation training programme conducted 5. No. of participants benefited from the training 6. Biomass mini-grid project development guide prepared	Lack of knowledge and experience in the development of biomass mini-grid projects in Nigeria.	5. Two biomass project development trainings conducted 6. More than 60 participants trained 7. Biomass mini-grid project development guide prepared	4. No. of persons trained. 5. Training material 6. Training evaluation report	Sustained support from Government, local planners, institutions and experts for RE based mini-grids.

Project Strategy		Objectively verifiable indicators				
		Indicator (quantified and time-bound)	**Baseline**	**Target**	**Source of verification**	**Risks and Assumptions**
Output 4.3	Capacity of RE related and financing institutions strengthened.	Number of RE related and financial institutions trained.	Financing institutions lack knowledge on assessment and evaluation of biomass based mini-grid projects. RE institutions lack knowledge and skill in biomass based mini-grids.	Minimum of 5 financing institutions and 2 RE related institutions trained.	4. No. of persons trained. 5. Training material 6. Training evaluation report	Sustained support from Government renewable energy institutions and financial institutions support..
Output 4.4	Capacity of local engineering firms and O&M companies developed in operation and maintenance of biomass power plants and mini-grid systems.	Number of local engineering companies trained in operation and maintenance services.	There is no or very limited local capacity for operation and maintenance of biomass Power plants in Nigeria.	More than 2 local engineering firms ready to provide operation and maintenance service	4. No. of persons trained. 5. Training material 6. Training evaluation report	Support of local engineering companies.

Annex F: Work plan – progress table

Activity	Year 1				Year 2				Year 3				Year 4				Status
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
PC 1-Development of techno-economic feasibility studies and business plans for identified potential sites to facilitate replication.																	
1.1 Techno economic feasibility studies and business plans developed for the three identified potential sites to facilitate replication.																	
a. Reconnaissance survey on biomass resources in Nigeria and identify the three potential sites			■	■													Completed
b. Prefeasibility study for the three potential sites					■	■											Completed
c. Develop techno-economic study report for the potential sites							■	■	■								Request for proposal to conduct detailed techno-economic study for the potential sites published. Tentative completion date is Oct./Nov. 2015
PC 2 - Demonstration of techno-economic viability of biomass based mini-grid																	
2.1 A biomass based power plant of 5 MW installed capacity commissioned in the selected site along with mini-grid																	
a. Arranging the necessary licenses, permits for construction of the biomass power plant			■	■	■	■											Completed
b. Study on insurance required for the plants during construction and operation								■									Completed
c. Preparing bidding document for Engineering, procurement and Construction (EPC) contractor								■									Completed

Activity	Year 1				Year 2				Year 3				Year 4				Status
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
d. Launching the bid document, bidding, evaluating and selecting the EPC contractor																	Completed
e. Financial closures																	Completed
f. Construction and commissioning of the biomass power plant																	EPC contractor awaiting mobilization
g. Conducting expert inspection during construction and commissioning by Owner's Engineers																	
2.2 Capacity on biomass power plant operation and maintenance (O & M) as well as mini-grid management developed																	
a. Prepare and finalize O&M work plan																	
b. Preparation of training materials for O&M and mini-grid management																	
c. Training to identified personnel on O&M and mini-grid management																	
2.3 The mini-grid independently monitored, evaluated, lessons learnt and information widely distributed																	
Preparation of leaflets and website for information dissemination																	
Disseminating the information through leaflets and website																	
PC3-Strengthening of financial and policy environment to support RE based mini-grid systems.																	
3.1 Feed-in-tariff (FiT) for biomass power in place																	
a. Gap analysis on policy requirements for RE based min-grid systems																	Completed
b. Recommendation on FiT for biomass power plants																	

Activity	Year 1				Year 2				Year 3				Year 4				Status
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
3.2 Appropriate financing facility developed for RE related projects.																	
a. Establishment and operation of the financing facility																	
b. Raising awareness among the stakeholders on the availability of financing facility through seminars and road shows																	
PC 4 Capacity development for replication of RE mini-grid technologies.																	
4.1 Local capacity in designing mini-grid developed																	
a. Preparation of training materials for designing mini-grids																	
b. Training to identified personnel on designs of mini-grid																	
4.2 Experts, planners and institutions trained in developing biomass based energy and mini-grid systems																	
a. Preparation of training materials for developing biomass based mini-grid systems																	
b. Training to identified personnel on developing biomass based mini-grid systems																	
4.3 Capacity of RE related and financing Institutions strengthened																	
a. Preparation of training materials for RE related projects for financial institution																	
b. Training to financial institutions on RE related projects designs																	

Activity	Year 1								Year 2								Year 3								Year 4								Status
	I		II		III		IV		I		II		III		IV		I		II		III		IV		I		II		III		IV		
4.4 Capacity of local engineering firms and O&M companies developed in operation and maintenance of biomass power plant and mini-grid systems																																	
a. Preparation of training materials for developing biomass based mini-grid systems																																	
b. Training to identified personnel on designs of mini-grid																																	