



GEF STRATEGIC PROGRAMME FOR WEST AFRICA

UNIDO Portfolio - Energy Component

## Regional and Country Level Projects



**GLOBAL ENVIRONMENT FACILITY**  
INVESTING IN OUR PLANET



ENERGY AND CLIMATE CHANGE BRANCH  
UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION



*This GEF-funded programme is jointly coordinated by UNIDO  
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# Index

## UNIDO-GEF Regional Project in West Africa:

Promoting Coordination, Coherence, Integration and Knowledge Management

## Country Level Projects:

1. The Republic of Burkina Faso: Promoting Energy Efficiency Technology in the Beer Brewing Sector
2. The Republic of Cape Verde: Small to Medium Scale Renewable Energy Systems in Cape Verde
3. The Republic of Chad: Promoting Renewable Energy Based Mini-Grids for Rural Electrification and Productive Uses
4. The Republic of Cote d'Ivoire: Promoting Renewable Energy-based Grids in Rural Communities for Productive Uses
5. The Republic of Guinea: Promoting Development of Multi-Purpose Mini-Hydro Power Systems
6. The Republic of Liberia: Multi-Purpose Mini-Hydro Infrastructure for Energy and Irrigation
7. The Federal Republic of Nigeria: Mini Grids based on Renewable Energy (Small-Hydro and Biomass) Sources to Augment Rural Electrification
8. The Republic of Sierra Leone: Promoting Mini Grids based on Small Hydropower for Productive Uses
9. The Republic of The Gambia Promoting Renewable Energy based Mini Grids for Productive Uses in Rural Areas



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

## Promoting Coordination, Coherence, Integration and Knowledge Management

### Background

West Africa is facing acute challenges in terms of access to energy at a cost, form, and quantity that can have an impact on economic development of the region. These challenges arise despite an impressive assortment of renewable energy resources West Africa possesses, including solar, wind, hydro, and biomass potential widely distributed throughout the region. These resources, if utilized prudently in concert with one another, could greatly expand access to modern energy services in the region, particularly in peri-urban and rural areas.

### Main Activities

- Set up a coordination and monitoring mechanism
- Assist in organization of meetings of the Programme Steering Committee for reviewing progress
- Project updates, monitoring reports to be circulated in target countries
- Workshops for knowledge management, experience sharing, best practices
- Assist in M&E of programme components and dissemination of results



### Outcomes

- Dissemination of best practices, information, and policy development
- Informed decision making
- Effective consultations and coordination between key stakeholders for achieving objectives
- Greater replication of individual projects and programmatic efforts
- Integration with priorities of Economic Community of West African States (ECOWAS) and Monetary Union of West African States (UEMOA).

### Objective

The specific objective of this GEF Regional Project is to strengthen the coordination and coherence among the country-level energy projects implemented under the Strategic Programme for West Africa's (SPWA) - Energy Component. The regional project seeks to create an enabling policy and institutional environment for promoting renewable energy and energy efficient technologies and markets in the West African Region. The project is fully aligned with the objectives of the Sustainable Energy for All Initiative (SE4ALL).

### Key Goals

- Political Ownership and stakeholder's commitment
- Platform for sharing knowledge and best practices
- Regional level technical meetings and training workshops for promoting cooperation and coherence in the ECOWAS region

### Progress

- ECOWAS High Level Energy Forum was organized from 29 to 31 October 2012 in Accra, Ghana. This forum was the first annual Ministerial meeting promoting cooperation among key stakeholders involved in energy projects and programmes in the region.
- The ECOWAS Ministers of Energy adopted regional policies on renewable energy and energy efficiency.
- A web portal the ECOWAS Observatory for Renewable Energy and Energy Efficiency (ECOWREX) has been developed and made operational for sharing knowledge and dissemination of best practices.
- A regional level renewable energy resource assessment has been carried out and a regional small-scale hydro power programme was developed.

## Promoting Energy Efficiency Technologies in the Beer Brewing Sector

### Objective

The project aims at promoting energy efficient industrial cook stoves in the beer brewery sector in Burkina Faso. It will focus on large cook stoves used in beer breweries in the region of the Plateau Central, around Ouagadougou.

Other benefits of promoting the improved cook stoves include the reduced concentrations of smoke and greenhouse gas emissions, reduced pressure on forests and related resources, skills development, and reduced costs of production resulting in higher income generation and productivity.



### Project Components

- Support improved cook stoves technology dissemination and demonstration:
- Upgrade the technical capacity for designing and constructing improved cook stoves for 100 stove manufacturers.
- Establish a financing facility for improved, energy-efficient cook stoves.
- Install over 1,000 improved, energy-efficient cook stoves.
- Assess the potential for biogas production from agro residues produced during beer brewing.
- Stimulate the market demand through the development of clusters of women beer brewers and the promotion of efficient supply and distribution chains for improved cook stoves.
- Scale-up by establishing national capacity for developing and implementing cook stove projects with carbon financing from voluntary carbon markets.

### Executing Partners

- The executing partners/agencies in this project are the Ministry of Environment and Sustainable Development and the Institut de Recherche en Sciences Appliquées et Technologies (IRSAT).

### Progress

- 4 geographical focus areas with a high concentration of women beer brewers/future clusters were identified.
- Collaboration with vocational training centers was discussed to provide their students with a training on cook stove manufacturing as part of their masonry curriculum – training to be provided by IRSAT, our local partner/research institute with 30+ years expertise in energy efficient cook stoves.
- Financing mechanism for women beer brewers and cook stove manufacturers is undergoing: a credit line from a Pan African bank to a local financial institution and a guarantee scheme located at women associations
- Comprehensive cluster diagnostic/potential of the 4 intervention zones (incl. value chain analysis and infrastructures mapping) is under finalization.
- Development of training materials for carbon financing and discussions with potential partners with Programme of Actions are in progress.
- National Coordination Committee with ministries, local and bilateral/international development partners was created at UNIDO's initiative and is about to be institutionalized by the counterpart.

### Budget

- GEF – US\$ 0.5 million (including PPG and agency fees);  
Co-financing – US\$ 0.73 million



# Small to Medium Scale Renewable Energy Systems in Cape Verde

## Objective

This project aims to address these existing barriers by promoting a broader and accelerated market based development of renewable energy technologies to create market conditions conducive to the development of small to medium scale renewable energy systems in Cape Verde.

## Progress

- The construction of two pilot projects is in progress.
- Training programmes for entrepreneurs were organized.
- Review of legal and regulatory framework is underway.



Telecommunication tower powered by PV in remote areas of on the island Sao Nicolau

## Project Components

- Design and construction of 3 demonstration RE projects with installed capacity of 1.6 MW
- Realization of a further 2 MW increase in installed capacity by scaling up renewable energy projects through use of a specialized RE seed fund established by GEF and the ECOWAS Renewable Energy Facility (EREF)
- Completion of a study on pathways to achieve 100% renewable energy in Brava Island
- Consolidation of a comprehensive legal and regulatory framework conducive to the development of small to medium scale renewable energy projects for productive uses.
- Training programmes for market enablers and actors, especially entrepreneurs and banks.
- Awareness raising activities, including targeted seminars, coaching clinics, and a regularly updated dedicated project website



Wind farm in Cape Verde

## Budget

- GEF – US\$ 2 million (including PPG and agency fees);  
Co-financing – US\$ 7 million

## Executing Partners

- The executing partners/agencies in this project are the Cape Verde Ministry of Industry and Energy and the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE).

## Promoting Renewable Energy Based Mini-Grids for Rural Electrification and Productive Uses

### Objective

The project seeks to promote solar photovoltaic renewable energy technologies for mini-grid rural electrification in Chad, and thereby reduce greenhouse gas emissions. The project will lead to the avoidance of GHG emissions while meeting the energy needs of Chad's rural areas through renewable energy systems.

### Progress

- The project has been recently launched.
- The contractor for construction of 4 solar mini-grids has been selected and the process of implementation started.

### Project Components

- Reduce policy barriers for the creation of grid connected renewable energy systems with the creation of a market-oriented institutional, financial, policy, and regulatory framework.
- Develop a package of investment incentives, standardised PPAs, tariffs, pricing mechanisms, risk management instruments, and business models to support scaling up RE mini-grids.
- Implement two PV solar based mini-grids on selected sites, with a total of .2MW capacity.
- Establish around 250 electricity connections per site by 2013, powering approximately 1250 households and local businesses and a total of approximately 6250 persons.
- Train a team of local authority officers and interested private sector service providers-to-be on the operation, maintenance, and management of RE based mini-grid systems.



### Budget

- GEF – US\$ 2 million; Co-financing – US\$ 1.8 million

### Executing Partners

- The executing partner/agency in this project is the Ministry of Energy and Petrol.



Douguia village inhabitants

# Promoting Renewable Energy Based Grids in Rural Communities for Productive Uses

## Objective

The overall goal of the project is to develop a market-based approach for improving the access to PV based mini-grids in rural areas in order to increase the rate of modern energy access of the rural populations to replacing the presently used fossil energies. This is through an integrated approach that combines substantial capacity building and learning-by-doing with technical assistance interventions at the policy and demonstration project level.

## Progress

- The trust fund agreement has been submitted to the government for signature.
- The government request to BOAD to co-finance the project for USD \$3 million is pending.



## Project Components

- Raise awareness of technical and socio-economic issues for government and private market players to promote capacity building.
- Design an effective, market-oriented policy and regulatory framework to stimulate investment in renewable energy, including the formulation of a model public-private partnership.
- Organize 3 seminars to train and familiarize policy makers, financial institution staff, and private sector representatives regarding roles and responsibilities in promoting RE mini-grids.
- Identify viable renewable energy project sites and conduct pre-feasibility studies for 10 most promising sites.
- Design and install 7 photovoltaic (PV) based mini grids for productive uses, totalling 350 kW of installed capacity.
- Establish approximately 1750 new electricity connections, with approx. 8750 persons served.
- Disseminate technical and policy information for promoting investments in renewable energy in rural areas, as well as the evaluation of pilot projects.

## Executing Partners

- The executing partner/agency in this project is the Ministry of Mines and Energy.

## Budget

- GEF – US\$ 1 million (including PPG and agency fees);  
Co-financing – US\$ 3.9 million



# Promoting Development of Multi-Purpose Mini Hydro Power Systems



## Project Components

- Upon sufficient mobilization of funds the inception workshop will be organized.
- Increase awareness of technical and commercial viability of mini-hydro by improving the regulatory and financial framework, including the introduction of targeted policy incentives.
- Prepare feasibility studies for two mini-hydro facilities and identify potential private sector investors, developers, and productive uses.
- Design and construct an 800 kW mini-hydro plant at one of the selected sites, providing electricity to approx. 400 local businesses and 3,000 households, representing 20,800 persons.
- Strengthen stakeholder awareness and technical capacities with extensive training on operation, maintenance, and management of small-hydro systems.
- Improve the information system on mini-hydro potential and the investment prioritization system at both the public and private sector level.

## Objective

The overall goal of the project is to develop the market environment for improving access to mini hydro-based modern energy services in rural areas. The project aims at removing the barriers to the promotion of a market approach to develop multi-purpose mini-grids powered by small hydropower facilities for meeting the growing need for access to electricity in rural areas, as well as the need for irrigation.

## Executing Partners

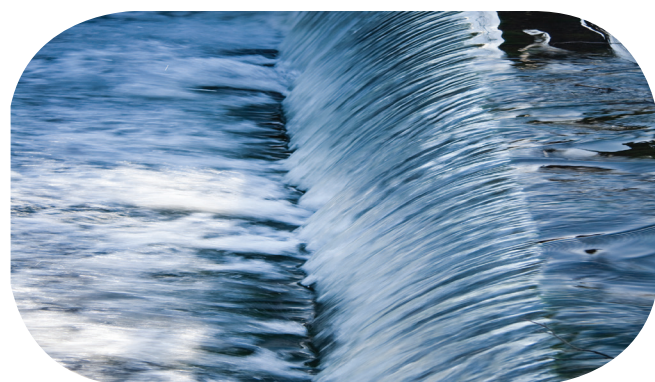
- The executing partner/agency in this project is the Ministry of Mines and Energy.

## Progress

- The study on the feasibility of the Keno small-hydro system has been finalized.
- Mobilization of the additional financial resources by the government and UNIDO is in progress in order to enable the option 2.1 MW selected by the government.
- Upon sufficient mobilization of funds the inception workshop will be organized.

## Budget

- GEF – US\$ 1 million (including PPG and agency fees);  
Co-financing – US\$ 1.5 million





# Installation of Multi Purpose Mini-Hydro Infrastructure for Energy and Irrigation

## Objective

The proposed project will establish a hydropower site in an off-grid isolated community (near Ganta) and use the process for learning-by-doing and building local capacity. The project will also review the existing regulatory framework and formulate recommendations to upgrade this framework, particularly on the financial mechanisms needed to promote private sector involvement in rural electrification. The project is expected to lay the foundation for a market environment for mini hydro-based renewable energy in Liberia, and will have a significant demonstration effect for rapid replication in other potential sites of the country.

## Progress

- Inception workshop was held and the steering committee was organized.
- Consulting activities are underway, and environmental impact assessment report was approved.
- Project management unit (PMU) is being established.



Kpatawee – Lower Fall of Meihn River

## Project Components

- Strengthen institutional capacity at national and local levels for implementation of mini hydro power (MHP) system for productive uses and improved energy access.
- Design and construct a 1 MW small hydropower based mini grid at identified site.
- Build capacity for local agencies to successfully operate and maintain MHP systems.
- Develop a policy and regulatory framework and appropriate incentive structure for future development of MHP systems to support energy access, irrigation, and productive uses.



## Executing Partners

- The executing partners/agencies in this project are Winrock International/USAID and the Rural and Renewable Energy Agency of the Ministry of Land, Mines and Energy.

## Budget

- GEF – US\$ 2 million (including PPG and agency fees); Co-financing – US\$ 4 million (issued)

# Mini-Grid Based on Renewable Energy (Biomass) Sources to Augment Rural Electrification

## Objective

The project is designed to provide support in creating an enabling policy and market environment for the attainment of the targets set for renewable energy, including the policy, regulatory and institutional framework and financing issues for promoting renewable energy (biomass) based mini-grids for augmenting rural electrification and productive uses in Nigeria setting up mini-grids; capacity-building; as well as public awareness.



## Project Components

- Develop business plans and techno-economic feasibility studies for 3 identified potential RE sites in order to facilitate replication.
- Strengthen the financial and policy environment to support RE based mini-grid systems for productive uses by aiding in the design of a feed-in-tariff for biomass power and the establishment of an appropriate financing facility.
- Design and construct a 5 MW biomass power based mini-grid for productive uses.
- Establish a system to independently monitor and evaluate the biomass power based mini-grid project, and disseminate lessons learned and vital information collected from the project.
- Strengthen stakeholder awareness and technical capacities with extensive training on operation, maintenance, and management of biomass power systems and mini-grids.
- Enhance the capacity of local planners, institutions, and experts for future scaling up of renewable energy based mini-grids in the country.

## Progress

- Inception Workshop was held in August 2012.
- The tender document for power plant is prepared.
- The study on feasibility of the mini-grid is completed.
- The special-purpose generation company was established.
- The acquisition of approvals from the local regulatory authorities is completed.
- The selection of one EPC contractor to be completed by October 2013.

## Executing Partners

- The executing partners/agencies in this project are the Energy Commission of Nigeria and the Federal Ministry of Environment, Housing, and Urban Development.

## Budget

- GEF – US\$ 3 million (including PPG and agency fees);  
Co-financing – US\$ 12 million

# Promoting Mini-Grids Based on Small Hydropower for Productive Uses

## Objective

The project aims to address institutional and technological barriers in the small hydropower sector through promotion of a market based approach to mini-grids that are powered by small hydropower systems.

Through the project access to electricity in rural areas can be enhanced at competitive costs without increasing the country's dependence on imported fossil fuels. The project has a strong industrial focus by applying renewable energy based mini-grids for productive purposes.

## Project Components

- Strengthen the institutional capacity for the mobilization of resources, planning and implementation of renewable energy mini-grids.
- Design and construct a 10 MW small-hydropower based local mini-grid for productive uses.
- Enhance local expertise for small-hydropower based mini-grids operation and maintenance.
- Strengthen institutional capacities and financial mechanisms.
- Develop policy and regulatory framework for small-hydropower.

## Progress

- Inception workshop and steering committee were organized.
- Consulting activities are underway, including preparation of environmental impact assessment report and gender mainstreaming components.
- Project Management Unit and Operational Management Unit are being established at the national and district level.
- In August 2012 high-level meeting was held to reinforce the commitment from the Government of Sierra Leone and secure co-financing from OFID and EBID. Furthermore, stakeholder consultations were held with relevant private sector players, civil society, and members of the local community to ensure their cooperation under the project.
- The activities on capacity-building and strategy development are ongoing.



UNIDO's Director-General and key partners visiting SHP site in Sierra Leone

## Executing Partners

- The executing partners/agencies in this project at the national level are the Ministry of Energy and Water Resources and the Ministry of Lands Planning and Environment in Sierra Leone.

## Budget

- GEF – US\$ 2 million (including PPG and agency fees); Co-financing – US\$ 30 million (issued)

## Renewable Energy Based Mini-Grids for Rural Areas in The Gambia



### Project Components

- Install renewable energy based mini grid capacity of at least 1.5 MW. This will be implemented on 3 different sites to demonstrate the technical and economic viability of renewable energy based mini-grids for productive uses in rural areas under various circumstances.
- Promote scaling up renewable energy based mini-grid investments through a detailed investment strategy, as well as outreach and awareness raising for key market players.
- Strengthen the legal and regulatory framework and institutional capacity to support investments in renewable energy based mini-grids.
- Draft and present a policy and regulatory framework document to the national authorities.
- Training programmes for the Gambia Renewable Energy Centre and other support institutions.

### Progress

- 900 kW grid-connected wind generators were installed and put into operation.
- Draft of Electricity Sector Plan and Renewable Energy Law was finalized.
- Training and awareness raising programmes for the policy-makers and private sector were organized.
- Connection of 450 kW wind turbine for fisheries project underway
- 9 kW wind and solar hybrid system was installed at a women's vocational training centre.

### Objective

The project seeks to develop and promote a market environment that will stimulate investments in renewable energy based mini-grids for productive uses in rural areas of The Gambia.

This project is designed to offer a systematic approach to remove policy, regulatory, legal and market barriers to enhance investments in renewable energy based mini-grids in rural areas of The Gambia.



### Budget

- GEF – US\$ 2 million (including PPG and agency fees);  
Co-financing – US\$ 4 million

### Executing Partners

- The executing partners/agencies in this project are the Gambia Renewable Energy Centre (GREC), the Ministry of Energy, the National Environment Agency (NEA), and the National Water and Electricity Company.