

TERMS OF REFERENCE

**Development of an Implementation Strategy for the Solar
Corridor under the West Africa Clean Energy Corridors
(WACEC) Initiative**

Février 2019

Background

The share of renewable energy in the energy-mix remains rather low in the ECOWAS region. This situation is a paradox considering the region's considerable renewable energy potential from all sources (hydro, solar, biomass and wind). The development of the renewable energy in the regional power system is facing various barriers related to policy, regulation, capacity and financing.

To remedy this situation, the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) launched, in collaboration with the International Renewable Energy Agency (IRENA), the West African Power Pool (WAPP) and the ECOWAS Regional Electricity Regulatory Authority (ERERA), the West Africa Clean Energy Corridor (WACEC) initiative. The main objective of WACEC is to support the development of utility scale renewable energy-based power, to promote the integration of renewable energy sources into the West African power systems and to foster a regional power market (trans-border trade). WACEC was endorsed by the ECOWAS Ministers of Energy during their meeting in Conakry, Guinea on 8 December 2016. More importantly, The West Africa Clean Energy Corridor initiative was adopted by the Authority of ECOWAS Heads of States and Governments in June 2017. This gives the initiative the political stock as a priority project of the ECOWAS.

The pillars for the implementation of WACEC are:

- ✓ Identification of high resource potential and environmentally sustainable zones for development of cost effective renewable energy power plants,
- ✓ National and regional planning for integration of cost effective renewables based power options into national and regional master plans for power generation and transmission,
- ✓ Enabling frameworks to promote investments,
- ✓ Capacity building to plan, operate, maintain and govern power systems with higher shares of renewable electricity generation,
- ✓ Public support to the initiative and awareness raising on the benefits of the WACEC.

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) with funding from the German Federal Ministry for Economic Cooperation and Development (BMZ) and the European Union (EU) is supporting all three regional organisations (ECREEE, WAPP and ERERA) in the framework of the programme “Promotion of a climate-friendly power market in the ECOWAS region”. The ProMERC support to ECREEE is cofinanced by the European Union (EU) in the framework of the project “Improving the governance of the RE and EE sector in West Africa” which is known by its French acronym AGoSEREE-AO and includes Mauritania as a beneficiary country. Consequently, GIZ is supporting ECREEE to develop strategies for regional corridors for solar, wind and hydropower in the frame of the WACEC initiative.

As the initiative seeks to tap into the renewable energy resource potential of the region, initial focus was given to solar energy and hydropower that are the most commonly shared resources by most of the ECOWAS countries. In that regard, ECREEE with the support of the EU Technical Assistance Facility (TAF) conducted an initial study on “West Africa Solar Corridor support programme and accompanying technical and economic considerations” in May 2017. Following this TAF study, the solar corridor roadmap document was also elaborated in January 2018.

The overall goal of the TAF study “West Africa Solar Corridor support program and accompanying technical and economic considerations” was to assess the **large-scale deployment of solar electricity generation** in Member States of the Economic Community of West African States (ECOWAS). Whereas, the roadmap focused on addressing specific barriers and challenges

impending the development of solar power in the region and formulated appropriate strategy recommendations.

From these two activities, it is evident that WACEC is a unique opportunity to convince the relevant stakeholders to develop a concrete strategy for scaling-up utility-grade solar power development in the region.

Within this context, ECREEE and GIZ are seeking the services of a consulting firm with experience in West Africa to develop a strategy for the implementation of the West Africa Solar Energy Corridor. The strategy will draw from existing documents, mainly, the West African Solar Corridor Road Map, prepared in 2018; the SE4ALL Technical Assistance Facility (TAF) for the West Africa Solar Corridor, finalised in 2017; and the ECOWAS Master Plan for Generation and Transmission from 2018.

Objective of the assignment

The objective of the assignment is to develop a strategy of implementation of the West Africa Solar Energy Corridor.

Specific objectives include at least:

- Departing from list of priority projects in the ECOWAS Revised Master Plan for the Generation and Transmission and the list of projects provided by ECREEE, assess the feasibility according to:
 - Availability of sub-stations,
 - Proximity to demand,
- Make the benchmarking of all solar projects in operation in West Africa in terms of LCOE, CAPEX, OPEX, PPA, Contract of Concession, Risk mapping and measures to mitigate these risks, financing structure etc. based on existing documents and the ECREEE National Focal Institutions.
- Analyze the replicability of the scaling solar concept or another type of bulk procurement in the region by cluster (see the clusters in the ECOWAS solar roadmap),
- Determine the types of viable schemes for the development of solar projects (PPP, IPPs, etc...),
- Propose financing mechanisms that can reduce the cost of energy of the projects, particularly through sovereign wealth funds, climate funds, etc.
- Develop an operational strategic plan for the implementation of the Solar Corridor (what to do, who must do it, when to do it, how to do it, where to do it, how much).
- Identify existing regional and global initiatives where synergies can be leveraged.

Main Activities

Preparatory phase

- Read background documents on WACEC, ECREEE solar corridor roadmap, EU TAF/ECREEE study, update of the ECOWAS Revised Master Plan for the Generation and Transmission of Electrical Energy and available solar resource assessments, along with grid information and protected areas, that may be available on the ECOWREX¹ platform and other platforms;
- Collect information on the status of solar power development including existing solar power plants and projects in the pipeline as well as solar radiation (direct, diffuse and global) measurement activities that have been or are being performed in the region (including Mauritania), based on the listed documents and ECREEE National Focal Institutions in each

¹ <http://www.ecowrex.org/>

concerning Member States, according three levels: i) under construction, ii) Financing and studies in the process of being finalized, iii) Identification/ Preliminary studies;

- Compile a list of stakeholders who are involved in solar power development in West Africa and could be key contributors toward the implementation of the Solar Corridor Strategy from ECREEE National Focal Institutions and others sources;
- Prepare an inception report that will include preparatory materials listed above and the outline of the West Africa Solar Energy Corridor Implementation Strategy that will be discussed in a kick-off conference call with the ECREEE/GIZ team.
- Review the inception report according to comments in the kick-off meeting.

Development of the implementation strategy of the solar energy corridor, through following points

Consult additional stakeholders through other communication means such as teleconferences and email in order to develop a draft of the strategy that will include among others:

- Define/Describe the implementation of “West Africa Solar Energy Corridor” and determine its interlinkages with the wind and the hydropower corridors;
- Make a concise proposal on implementing the strategy including different activities and funding opportunities from key partners/actors;
- Prioritize and assess the feasibility of the projects identified by the ECOWAS Revised Master Plan for the Generation and Transmission and the list of projects provided by ECREEE.
- Make concrete proposals to mitigate the technical constraints identified by the EU study, such as grid constraints in areas with high radiation potential, for the development of solar projects;
- Assess reserve capacity requirements – management of intermittencies, in national and regional level (installation of batteries, STEP, etc.), based on EU-TAF, update of the ECOWAS Revised Master Plan for the Generation and Transmission and the Assessment of Battery storage applications in the West African Power Pool (WAPP) utilities and countries;
- Select case studies of potential solar projects that can be developed in the region;
- Identify capacity building needs for the various stakeholders (public, private and research institutions) in the region to promote solar power development;
- Determine the types of viable schemes for the development of solar projects (PPP, IPPs, hybrid solar-hydro innovative projects, etc.). SWOT analysis of each type;
- Make concrete recommendations on the activities to be implemented by ECREEE and all relevant stakeholders within the following timetable: 2020, 2025 and 2030, in the form of detailed schedule;
- Make recommendations concerning application of schemes such as world Bank "Scaling Solar" program in regional level by clusters;
- Other proposed activities to overcome the identified barriers (awareness-building, etc.);
- Submit the draft report to the ECREEE/GIZ team for comments and suggestions and finalize the draft upon receiving feedback.

Stakeholders workshop

- Prepare a presentation on the solar corridor strategy to be presented by the consultant during a workshop in West Africa (country will be define later);
- Update the solar corridors strategy document according to the the stakeholders inputs.

Final report (French and English)

Submit the final report in French and English.

Deliverables

Deliverable
Inception report incl. draft outline of the strategy and preparatory materials listed above
Draft strategy and presentation summarizing the strategy for stakeholder workshop
Final Solar Corridor Implementation strategy

Time schedule

The contract period is expected to be between 01.04.2019 and 30.06.2019.

Consultant's profile

Renewable Energy specialist

Master Degree or higher in renewable energy or equivalent. Senior renewable energy specialist with at least ten (10) years of relevant experiences with solar power projects (resource assessment for solar projects for identification of viable sites, economic analysis and financial modelling related to solar energy projects) and development of RE-related strategies and/or action plans.

She/he has to prove experience in handling similar assignments with at least 3 similar assignments undertaken.

Good knowledge of the related activities that are being implemented or planned by other relevant actors (WAPP, ERERA, IRENA, World Bank, AFDB, ABREC, etc.);

The expert needs to be fluent in English and French.

Power System Planning Expert

Master Degree or higher in Electrical Engineering, at least ten (10) years of power system design and planning experience in Investment plans and Master Plans.

The Power System Expert shall have Experience in Power system planning with an emphasis on transmission and distribution The Expert shall have experience in handling similar assignments with at least 3 similar assignments undertaken.

A good Knowledge of WAPP electrical interconnected grid would be an added advantage.

The expert need to be fluent in English and French.

Estimated level of input

The estimated level of input for the Renewable Energy Expert is **(35** person-days incl. one mission to West Africa.

The estimated level of input for Power System Planning Expert is Ten **(10)** person-days).

The offer documents have to inform on detailed tasks of each of the respective STEs.

Background documents

- West African Solar Corridor Road Map,
- EU SE4ALL TAF: West Africa solar corridor support programme and accompanying technical and economic considerations,
- West African Clean Energy Corridor Concept Note,
- Update of the ECOWAS Revised Master Plan for the Generation and Transmission of Electrical Energy Master plan,
- IRENA: Unleashing West Africa's renewable energy potentials : Reports on Solar and wind opportunities IRENA: WACEC Concept Note,
- ECREEE case studies on the solar energy projects,
- Assessment of Battery storage applications in the West African Power Pool (WAPP) utilities and counties.