OSAKA CONSULT

Consultancy Services for WAPP Distribution Utilities Development Programme:

Terms of Reference

PRESENTATION OUTLINE

- Background
- Objectives of Assignment
- Scope of Assignment
- Deliverables
- Qualification and Experience
- Inputs and Services by Client

INTRODUCTION / BACKGROUND[1]

The West African Power Pool…

- Is a specialized institution within ECOWAS with diplomatic immunities to operate in all ECOWAS member states

- WAPP was created in 1999 but became fully functional in 2006
- WAPP is committed among other objectives, to the creation of a robust and efficient regional electricity markets.

Background cont.

Vision

Integrate the operations of national power systems into a unified regional electricity market, which will, over the medium to long term, assure the citizens of ECOWAS Member States a stable and reliable electricity supply at competitive cost

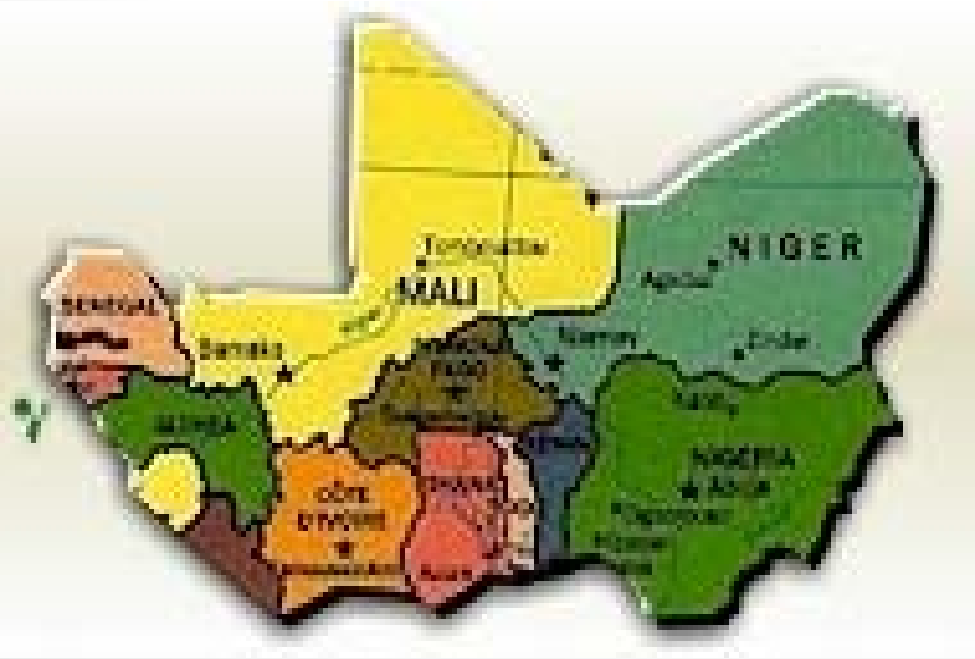
Mission

Ensure the promotion and development of power generation and transmission facilities, as well as the coordination of power trade between ECOWAS Member States.

ORGANIZATION OF WAPP COUNTRIES

WAPP Zone A

- Benin
- Burkina Faso
- Cote d'Ivoire
- Ghana
- Niger
- Nigeria
- Togo



WAPP Zone B

- Gambia
- Guinée
- Guinée-Bissau
- Liberia
- Mali
- Senegal
- Seirra-Leone

Member Utilities

These Utilities are predominantly State Owned and lack independent Regulators in Most cases

BACKGROUND – CONTD.

- WAPP has developed a Generation and Transmission Master Plan.
- Currently implementing major 330 kV Transmission Backbone Projects in the WAPP region.
- Secured funding to build an Information Coordination Center (ICC).
- However, there are **Operational Challenges** within the Distribution Network of member countries

KEY OPERATIONAL CHALLENGES.

- Financial Challenges
- High Technical Losses
- High Commercial Losses
- Manpower Challenges

Operational Challenges–Cont.

Financial Challenges:

- Inability to self-finance capital investment projects; and,
- Absence of cost-reflective electricity tariffs.
  - Macro-economic variables (e.g. exchange & inflation rate);
  - Increase in world market prices of distribution materials.

ELECTRICITY DISTRIBUTION CHALLENGES[2]

Technical Challenges

Rapid electricity demand growth and need for network expansion

- High suppressed demand;
- Few but long rural networks;
- High technical losses;
- Increasing demand of existing customers (organic growth);
- Weak network assets leading to frequent power outages; and,
- Low electricity penetration to rural dwellers.

ELECTRICITY DISTRIBUTION CHALLENGES[3]

Commercial Challenges

- High commercial losses
- Poor metering
- High customer population growth; and,
- Poor revenue collection.

Impact of Tech. and commercial Losses.

Technical Losses:

- Due to the inefficient and undersized lines and transformers, wasted power is unavailable to serve customers

Commercial Losses:

- Lost Revenues are unavailable to pay operating cost and investment for grid extension

Operational Challenges–Cont.

Manpower Challenges

- Insufficient Specialists in Key areas for the Utilities such as Commercial Experts, Technical Operations and Maintenance, System Planning, needed to cope with modern technology application in the industry.

- Low Experience in Electricity Market Operations

OBJECTIVES OF THE ASSIGNMENT

To attain a sustainable Regional Electricity Market by ensuring viable WAPP Distribution Utilities:

- in improving Energy Efficiency (improve energy conservation methods/demand side management)
- In reducing Energy losses in electricity distribution below 10% leading to sound financial viability
- In improving Revenue Collection through efficient metering systems
- in increasing Quality of Suppy, Market Size and electricity Access for all, in service area

Scope of Assignment

1. **Financial Viability**: Conduct a Viability study of each of the Distribution Utilities by examining the causes, impact, and remedy on the Utility against the follow:

- The utility's ability to pay for the access to adequate supply against total customer peak demand and energy requirements.
- The Utility total units energy lost over purchases in operation i.e. lost/wasted energy generated

Financial Viability–Cont.

- The inadequacy of tariffs for the Utility's product.
- The unpaid bills arising out of customers unwillingness to pay and Utility's poor Revenue collecting practices.

Propose interventions to address:

- The supply side capacity inadequacies to meet the market demand
- The Utilities ability to financially pay for power from IPPs wheeling power through the WAPP transmission backbone

Financial Viability–Cont.

- Examine the use of metering methodologies that promote customer's demand side management and energy conservation practices that reduce peak demand and wastages
- Examine the use of automatic meter reading systems for industrial customers and prepayment metering for residential and small scale customer to reduce revenue Loss.

2. **System Loss Study**: Determine the level of total losses for each Utility.

- Estimate the proportion of Tech. and commercial Losses
- Prepare mitigating measures to address these Losses

System Loss Study-Cont.

- Review/ Propose energy audit with network metering throughout the supply chain
- Prepare indicative plans and targets for capital expenditure to reduce the overall Losses to below 10% by the end of first 5year implementation period. Further reduction plans should improve progressively.

Scope of Assignment-Cont.

3. Ascertain the actual market size of each Utility by the following:

- Compare Area covered(Km2) with mandated service Area.
- Compare Total customers served to service area population.
- Compare Peak load(Mw) and Energy (Mwhrs)served to total served and unserved. Note especially large industries unserved and suppressed demand.

Scope of Assignment-Cont.

4. Propose Bankable Energy Efficient Improvement Programmes and System Expansion Projects. Projects should address all bottlenecks in urban Areas and meet 80% Penetration for Rural Electrification by the end of the 5 years of implementation.

The following key activities are expected:

1. Produce Load forecast report for 5, 10, and 15 years horizon.
2. Produce cost estimates report with economic and financial justification.

Key Activities cont.

3. Produce environmental and social impact assessment and mitigation plan.
4. Produce distribution master plan with bankable projects for each utility

Scope of Assignment-Cont.

5. Prepare demand forecast for prepayment meters for the next 5 years.

6. Assets and Facilities review Report.

7. Training manpower Requirements.

DELIVERABLES

The under listed are the expected deliverables from the consultant

1. Submit Diagnostic Viability Report highlighting requirements for each utility
2. Determine candidate expansion projects
3. Determine candidate projects for energy efficiency improvement
4. Develop guidelines for producing bankable project for energy efficiency improvement
5. Develop guidelines for producing bankable project for network expansion

QUALIFICATION AND EXPERIENCE OF CONSULTANTS

- **Team Leader** – First University Degree or higher in Electrical Engineering+ 15 years experience covering similar assignments in a developing country

- **Power Distribution Expert /Commercial Expect**– First Degree or higher in Electrical Engineering + 10 years of power distribution experience in System Construction, Protection, Operation & Maintenance, and Metering and Billing Systems, etc;

- **Power System Planning Expert** – First Degree or higher in Electrical Engineering plus ten (10) years of power system design and planning , including demand forecast, sub-transmission and distribution development planning. Experience in power system planning including demand forecast, distribution development planning, economic and financial analysis and customer service standards

QUALIFICATION AND EXPERIENCE OF CONSULTANTS-cont.

- Economic/ Financial Expert– First Degree or Higher plus 8 years experience in Power System Financial management & Planning, Investment Analysis
- Environmental Expert – First Degree or Higher in Environmental studies plus 5 years Experience in similar assignments with at least one similar assignment undertaken in African Country.

INPUTS AND SERVICES BY CLIENT

- The WAPP Secretariat shall provide office and secretarial assistance at Cotonou, Benin, and distribution utilities shall provide office and secretarial assistance.

- WAPP and Distribution Utilities members shall pshall provide one (1) Project Coordinator from its secretariat to liaise with the consultant and the distribution company staff who are allocated to the study

- The participating distribution member company will provide at least two (2) electrical engineers and one economist/accountant who will assist the consultant to conduct Field Survey

THE WAY FORWARD

- WAPP Secretariat to source for funds to execute the proposed interventions;
- WAPP member countries to be split into two groups (i.e. francophone and anglophone) and assigned to two consulting firms to execute proposed interventions;
- Each assignment to be monitored by both the WAPP Secretariat and the member countries involved;
- Distribution utilities challenges expected to be eliminated by end of the project.

CONCLUSION

We have presented…..

- The role of WAPP in the West African power sector;
- Challenges of electricity distribution utilities in the sub-region;
- Major challenges which are prevalent in all member countries;
- WAPP proposed interventions to overcome the challenges of the distribution utilities; and
- The way forward.

It is expected that the interventions will yield the desired results

THANK YOU FOR YOUR ATTENTION MERCI

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