



**ELECTRICIDADE
DE MOÇAMBIQUE, E.P.**

REVENUE PROTECTION AND LOSSES CONTROL DIRECTORATE

Terms of Reference

for

**INDIVIDUAL CONSULTANT FOR THE ASSESSMENT, DESIGN AND
ROADMAP DEVELOPMENT OF EDM'S GIS CUSTOMER MAPPING AND
SYSTEMS INTEGRATION FRAMEWORK.**

UNDER

ASCENT

Maputo, July 2026

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1 PROJECT BACKGROUND

1.1. MOZAMBIQUE'S ELECTRICITY SECTOR AND EDM'S GENERAL FACTS

Electricidade de Moçambique (EDM), is a vertically integrated, government-owned electric utility with an installed capacity of 140MW hydropower (86MW operational) and installed 109MW (82MW operational) in thermal power stations. EDM buys most of its power supply (400MW) from Hidroelectrica de Cahora Bassa (HCB), the owner and operator of the Cahora Bassa power plant on the Zambezi River (2,075 MW). The GoM owns 82% of HCB, which operates as an Independent Power Producer (IPP). The bulk of the electricity generated at HCB is exported to South Africa, with a small amount to Zimbabwe. EDM sells any excess electricity on the Southern Africa Short Term Energy Market. The Mozambique transmission grid is currently interconnected with South Africa, Zimbabwe, Swaziland and Malawi.

The government considers the energy sector as a priority, and it is committed to ensure that will attract private investment to this area and promote the development of the national electricity grid.

In October 1997, in line with international trends towards greater market liberalization, the Electricity Law (Law 21/97 of 1 October) was promulgated. This changed some of the principles underlying the national framework, namely:

- It ended the state monopoly on the generation, transmission, distribution and sale of electricity, and stressed private sector participation in the development of the national grid;
- The state retained its role of regulating/promoting the development of the sector;
- It established the general legal framework for activities in the sector, to be undertaken through concessions;
- It established the National Electricity Council (CNELEC), now Energy Regulatory Authority (ARENE), a consultative and regulatory body on matters of national electricity policy, and on the application of the law and its regulations. Under the law, EDM must report regularly a set of KPI's to ARENE.

- Under Article 42 of the above-mentioned Electricity Law, specific regulations were approved establishing the Energy Policy (Resolution 05/98 of 3 March) and giving EDM the role of Transmission System Operator and the Regulations for the Electricity Law that defined the powers and procedures for granting concessions for the generation, transmission, distribution and sale of electricity.

Through Resolution 24/2000, of October 3rd, the Electricity Law established a number of specific requirements for EDM to ensure more concise and reliable data about the various stakeholders in the energy sector. These include, in particular:

- Separation of the accounts for the generation, transmission and distribution of electricity;
- Restructuring the cost and accounting system, establishing separate accounts for each business unit;
- Ensuring that management information is available to support government decisions at national and regional level on tariffs, electricity supply, competition, concession holders, etc. It should be noted that tariff policy is approved by the Council of Ministers and is updated regularly.

1.2. SIGEM PROJECT

Since 2012, under EDAP program financed by World Bank, Electricity of Mozambique (EDM) implemented a major restructuring project called Sistema Integrado de Gestão da EDM – SIGEM, as one of core initiatives of the company, which aimed to empower and modernize the organization and its management model.

As stated on the project document, the main reasons for the implementation of the Integrated Solution at EDM it was because the company aimed to overcome the following issues:

1.3. INEFFECTIVE OPERATIONS

- Generally low performance in company vital business operations;
- Significant number of manual processes and paper circulation between offices;
- Duplicity of effort;
- Data inaccuracies;
- Manual and repetitive activities that increase the risk of human error;
- Lack of standardized procedures;
- Business carried out differently depending on the region/division;
- Inadequate Information Systems;
- Lack of validations and controls, hence, very open to fraud;
- Important business processes are not covered or partially covered (a significant number of manual activities are required);
- Lack of interfaces and integration between applications (islands of information);
- Delayed and inaccurate operational and managerial information, mostly manually produced;
- Generally Low performance;
- Insufficient Communication Infrastructure to meet business requirements;

1.4. INAPPROPRIATE ORGANIZATION

- Inappropriate organizational structures for the business;
- Generally based on system/resource constraints instead of being business oriented;
- Unclear distribution of responsibilities and accountabilities;
- Duplication of functions and responsibilities;
- Processes mostly oriented to execute repetitive operations, instead of managing and improving them.

1.5. EXTERNAL FACTORS

- Regulatory issues in force in the country, such as new reporting requirements;
- Commercialization/market requirements;
- International reporting standard to which EDM and the Country must adhere to.

The SIGEM project included the installation in the whole EDM of the following Management Information Systems to improve the company's operations and management and enhance corporate governance:

- A Commercial Management System (CMS), to support customer service and all commercial operations within the company (consumption metering, reading, billing, collection, attention of customers in agencies or through call center, disconnection and reconnection related to commercial debts, new contracts, etc.);*
- An Incident Recording and Management System (IRMS) lately renamed Outage Management System (OMS), to enable EDM to better respond to client contingencies by automating the detection of distribution faults and ensuring the quality of power supply;*
- A corporate resources management information system (ERP-GIAF) for the entire EDM, to integrate the management of all the corporate processes and resources of the company under*

- a single technological platform, such as accounting and finances, human resources, procurement and logistics including, plant and equipment maintenance, etc;
- iv. *Internal Communication Systems (ICS)*, which is the telecommunication backbone on which all EDM's sites will be connect;
 - v. *Automatic Meter Reading (AMR)*, a revenue protection component of large customers through Smart Metering.

1.6. THE PERIP PROJECT

The success of the Government of Mozambique's (GoM) policy and programs in attracting investment and growth of the economy, combined with a massive rural electrification program, have resulted in rapid energy demand growth and consequently the electricity sector is now facing supply constraints as longer term projects are being implemented.

Currently, the power supply is not reliable in the three regions of Mozambique. It is interrupted almost on a daily basis during peak hours. The interruptions are unacceptable since they affect among others the industries, water supply and harbor operations.

A number of emergency rehabilitation and reinforcement projects – in the form of the Power Efficiency and Reliability Improvement Project (PERIP) – are being implemented in order to minimize power supply interruptions and maintain security of electricity supply as well as to satisfy short-term demand and to improve electricity access, reliability and quality of supply to consumers in Mozambique. The above said emergency rehabilitation and reinforcement projects include:

1.7. STABILIZATION AND CONSOLIDATION OF THE USE OF GIAF-ERP FOR MANAGEMENT OF CORPORATE RESOURCES OF THE COMPANY

The objectives are to provide support EDM to review and optimize execution of processes and activities (P&A) for management of corporate resources of the company through the GIAF-ERP making systematic use of the functionalities of the information system.

1.8. SUPPLY, INSTALLATION & TRAINING OF AN IMS IN SUSTAINABLE ENERGY AND BROADBAND ACCESS IN RURAL MOZAMBIQUE PROJECT

The Government of Mozambique has applied for financing from the World Bank toward the cost of the SUSTAINABLE ENERGY AND BROAD BAND ACCESS IN RURAL MOZAMBIQUE PROJECT (ProEnergia+), and applied part of the proceeds toward payments under the Contract for Supply, Installation & Training of an IMS.

The IMS include the installation in the whole EDM of the following Management Information Systems to improve the company's operations and management and enhance corporate governance as follows:

- (a) a Corporate Resources Management Information System (also identified as “enterprise resource planning (ERP)” for the entire EDM, to integrate the management of all the corporate processes and resources of the company under a single technological platform;
- (b) a Work Force Management System (WFM);
- (c) an Enterprise Asset Management (EAMS).

1.9. GIS PROJECT DESCRIPTION

Considering the complexity of the national power network, the territorial extension and the high load growth, it is essential to proceed with the designation of the Assets for Generation, Transmission and Distribution Network, and to develop platforms for the management of these assets (“stock”, quantities, specification, operation and maintenance tools of the assets), regardless of their location. In the other hand, part of Distribution network particularly for Maputo City was gathered (less than 10%) and stored at the old GIS (NCIS) and now is being migrated and validated into the new GIS (GIS Core) provided by INDRA.

At the moment, regarding the GIS system, data from the NCIS system has been migrated and ongoing data gathering via mobile devices (GIS Mobile) for Distribution networks and customers being completed in Customers Service areas of Ka-Mavota, Ka-Maxakeni and Ka- Mbucwana. This data will be used for graphical operationalization of Distribution Management System (DMS).

Regarding interfacing between GIS/DMS and EAMS upgrade of the available GIS to corporate GIS has been considered upfront condition and a proposal for this upgrade has been received from the provider of the existing GIS and need to be evaluated.

For transmission and Generation, the required technical Assistance is to define a conceptual approach for mapping T&G assets / construction units.

Below are the asset / family of assets (construction units) categories to be considered on the data gathering from the electric chain managed by EDM:

- Generation Power Plants;
- Electric power transmission lines and their respective components and supports;
- Electrical Substations, Mobile Substations and switching stations;
- HV/MV Substation & Switching Stations
- MV lines and poles;
- Secondary Substations (Tx)
- LV lines and poles;
- Meter / Meter boxes

All above described categories gathered and stored at the FDB as layers and follow the electrical connectivity according with Common Information Model¹ (IEC 61970 – Transmission / EMS, IEC 61968 – Distribution / DMS, IEC 62325 – Electricity Markets) rules including geographical world schematic world and SLD World visualised on open source maps.

All EDM's customers are also part of the layers considered on the GIS.

a. Power Plants

There are 18 different power stations distributed throughout the country, which its descriptions can be consulted in the reference manual (REN's Transmission Assets Nomenclature Manual).

b. Transmission Lines

The national power grid comprises an extension of about 8,000km of transmission lines, distributed in voltage levels, namely: 535kV, 400kV, 330kV, 275kV, 220kV, 132kV and 110kV. With the new

¹ The Common Information Model (CIM) is an international IEC standard that defines a common, object-oriented data model for representing electric power system assets, topology, measurements, and business processes, enabling interoperability between utility IT/OT systems from different vendors.

grid code 66 kV is no longer transmission, it's distribution, therefore there's need to review the extension of the transmission lines, but as of the moment it will be included in this phase, due to the fact that it is still under transmission management.

The designation of transmission lines and their respective supports follow the same philosophy as proposed in the reference manual (REN's Transmission Assets Nomenclature Manual).

c. Primary Substations

There are 91 primary substations (80 fixed and 11 mobile), throughout the country. Its description can be consulted in the reference manual (REN's Transmission Assets Nomenclature Manual).

d. MV/LV lines

The distribution grid is comprising an extension of 31.026 km of Low Voltage lines and 23.658 km of Medium Voltage lines distributed as follows: 33 kV – 20.363 km; 22 kV – 1.803 km; 19,1 kV – 112 km; 11 kV – 1.182 km; 6,6 kV – 197 km; 0,4 kV – 31.026 km.

e. Secondary Substations (Tx)

It also comprises 16.530 Power Transformers distributed per MV lines level as follows below: 33/0,4 kV – 12.383; 22/0,4 kV – 1.295; 19,1/0,23 kV – 19; 11/0,4 kV – 2.400; 6,6/0,4 kV – 433.

f. Customers

The estimations of EDM's customers are around **3,114,927**, where: Domestic (2,867,451), Commercial (238,647), MV Customers (4,821), Large Customers Unit (2,286), Social (1,431), MV agriculture (202), LV agriculture (89), HV Customer (1);

There are other customers considered as irregular, in average of 14.

2 CONSULTANCY SERVICES AND PROJECT GOALS

2.1 SCOPE

The consultancy entity responsible for Supporting EDM will be responsible for:

a. Assessment of current situation of implementation of EAMS and GIS mainly focus on the modules forecasted to be implemented on EAMS and for this purpose EDM will provide GIS/EAMS/WFM Bidding Documents to the consultant.

Also, the consultant will evaluate the current situation of EDM contact centre. The general objective is to establish a systematic, efficient, and scalable process for the geolocation of all EDM customers, using office-based strategies and existing digital platforms. Specifically, the consultant will assist EDM on the following:

- To integrate the Call Centre into the customer location data collection workflow;
- To create a regional GIS Back-office Units dedicated to interpreting and geocoding customer-reported locations at regional level;
- Create a Campaign Environment (Desktop and Mobile) for, mainly, Data Centre information collecting and validation and massive connection data collection and validation;
- Integrate the created Campaign Environment with the EDM corporate GIS database to support Distribution operations such as DMS/OMS/SCADA with reliable spatial data;
- To ensure data is validated using EDM's infrastructure network (MV/LV), CMS, MDM, and GIS;
- Confirm geographical data of existing EDM customers in CMS;
- Gather geographical data of obtained customers information from contact centre, inspections;
- Geolocation of connected Customer' under electrification Plan (Proenergia Project);
- GIS and Infield integration to Update the CMS;
- Regularization of illegal / informal connections, as part of a Commercial activity.

b. Define a road map for implementation of “Campaign GIS Workspace” (Restricted Parallel Environment)

The purpose is to create a controlled GIS environment where back-office teams can register or update customer location data, ensuring quality validations before synchronizing with the Corporate OneSait GIS. This GIS environment will receive information from Call Centre, As Built documentation (Pro Energy+ others), Customers location from WO Field working team, Inspections, etc.

In this case the consultant will assist EDM on definition of System capabilities, functional requirement, validation rules, Interfaces needed and training.

b.1 Define a roadmap for the following interfaces:

Interface	Purpose
Campaign GIS → OneSait GIS	Push validated customer locations
Campaign GIS → CMS	Validate meter number on the Campaign GIS
OneSait GIS → Campaign GIS	Provide reference LV network layers
Campaign GIS → Infield App	Obtain Customers location through Inspections / new connections
Call Center → Campaign GIS	Feed tickets requiring mapping

b.2 Development of Standard Operating Procedures (SoPs)

The consultant will assist EDM on development of Standard Operation Procedures (SOPs), namely:

- Call Centre data capture script;
- Geocoding procedures;
- Quality control rules;
- Data update workflows.
- Others.

b.3 Establishment of Regional GIS Back offices

Presently EDM has four regions and each region has its regional Distribution Operation centre (COD) that receives incidents and other information registered by the national contact centre related to its Customers Services Areas (CSA). The purpose of creating a regional back-offices is to locally validate information coming either from contact centre, field crews and third parties. In future EDM have to consider allocating the back-offices in its internal organization structure.

2.2 SPECIFIC TASKS

In order to achieve these objectives, the Consultant will fulfil the following tasks:

Task 1: Assessment of EAMS–GIS Integration Challenges (Scope Component 1: EAMS–GIS Integration Constraints.)

The Consultant shall:

- Review the current architecture and implementation status of both EAMS and GIS platforms;
- Analyse the technical constraints affecting integration between EAMS and GIS;
- Assess the validity of the GIS provider's claim that the existing GIS is a *campaign-based system* and not compliant with Corporate GIS requirements;
- Evaluate the extent to which the current GIS platform supports integration (APIs, data models, interoperability standards);
- Identify gaps preventing successful interface development between the two systems;
- Provide recommendations for enabling integration, including:
 - System enhancements,
 - Middleware solutions,
 - Data model harmonization.

Task 2: Technical and Commercial Review of Proposed GIS Upgrade / Scope Component 2: Review of GIS Upgrade Proposal.

The Consultant shall:

- Review the proposal submitted by the GIS provider for upgrading the current system to a Corporate GIS;
- Assess the proposal against:
 - Industry best practices,
 - EDM operational requirements,
 - Scalability and interoperability needs;
- Evaluate whether the proposed upgrade is:
 - Technically justified,
 - Cost-effective,
 - Aligned with the original contract scope;
- Identify any risks of vendor lock-in or over-specification;
- Provide an independent recommendation on:
 - Whether to upgrade, replace, or optimize the current GIS system.
- Review the original Terms of Reference and contract used for procurement of the GIS system;
- Compare the contracted requirements with the currently installed and operational system;
- Verify compliance of delivered functionalities, including:
 - Data management capabilities,
 - Network modelling,
 - Customer and asset integration,
 - Enterprise-level performance;
- Identify deviations, omissions, or under-deliveries;

Provide recommendations on corrective actions, including contractual remedies where applicable.

Task 3: Design of Customer Mapping Campaign and Data Management Framework

The Consultant shall:

- Assess EDM's requirements for large-scale customer and asset data capture;
- Design a framework for implementing **on-desk GIS data validation campaigns**, including workflows, tools, and quality control mechanisms;
- Define the architecture for a **Campaign GIS Environment**, including:
 - Data ingestion from multiple sources (mass connections, call center, field projects),
 - Data validation processes,
 - Temporary storage and staging mechanisms;
- Propose integration mechanisms between the campaign environment and the Corporate GIS database;
- Define data governance procedures (validation, approval, versioning, audit trails).

Task 4: Design and Operationalization of GIS Back Offices

The Consultant shall:

- Define the structure and operational model for:
 - Four (4) Regional GIS Back Offices,
 - One (1) Central Back Office dedicated to the Mass Connections Project;
- Specify:
 - Roles and responsibilities,
 - Staffing requirements,
 - Skills and training needs;
- Develop standard operating procedures (SOPs) for:
 - Data validation,
 - Data integration,
 - Quality assurance;
- Recommend ICT infrastructure and system requirements for the back offices;
- Define performance indicators and reporting mechanisms.

Task 5: Enterprise Systems Integration Strategy

The Consultant shall:

- Assess integration requirements between:
 - GIS (Corporate and Campaign environments),
 - EAMS,
 - Customer Information Systems,
 - EDM Contact Center systems;
- Propose an integration architecture, including:
 - Data exchange standards,
 - APIs and middleware,
 - Synchronization mechanisms;
- Develop a roadmap for phased integration and implementation.

3 DELIVERABLES

The Consultant will prepare and submit to EDM the following reports:

1. Inception Report ;
2. Report on Task 1: Diagnostic Report (EAMS–GIS + Contract Compliance);
3. Report on Task 2: GIS Upgrade Evaluation Report;
4. Report on Tasks 3&4: Back Office & Campaign Framework Design;
5. Report on Task 5: Integration Architecture Report.

4 PAYMENT SCHEDULE

The Contract shall be based on a Lump-Sum payment arrangement with a fixed Contract Price.

The Contract Price shall be deemed to include all costs necessary for the proper execution of the Services, including all expenses related to on-site missions. Such costs, including travel and communication expenses, accommodation, meals, air tickets, and subsistence allowances for travel to Mozambique, shall be fully incorporated into the Lump-Sum Contract Price and shall not be subject to separate reimbursement.

Reimbursable Expenses			
#	Description	Unit	Quantity
1	Airfare	Number of Trips	5
2	Per diem	7 per visit	35 days (7 days × 5 visits)
3	Accommodation	7 nights per visit	35 nights (7 nights × 5 visits)
4	Communication	1 per visit	5 visits
5	In country Transportation Allowance	7 days per visit	35 days (7 days × 5 visits)

The Consultant remuneration shall be paid in accordance with the following payment schedule, based on the submission and approval of the respective deliverables:

- 15% of the lump sum amount upon submission of Inception Report;
- 20% of the lump sum amount upon submission of Report of Task 1, duly approved by EDM;
- 25% of the lump sum amount upon submission of Report of Tasks 2, duly approved by EDM;
- 20% of the lump sum amount upon submission of Report of Tasks 3&4, duly approved by EDM;
- 20% of the lump sum amount upon submission of Report of Task 5, duly approved by EDM.

5 SUPERVISION OF WORKS

The Consultant will work in close cooperation with the Project Coordinator and other departments of EDM as well as with the World Bank's Energy Team.

6 PROCUREMENT METHOD

The consultant will be hired on the basis of the provisions of the **Procurement Regulations for IPF Borrowers, dated September 2025**. The Procurement method will be Individual Consultant Selection.

7 DURATION

The duration of the technical Assistance will be 12 months and within the period the consultant will conduct 5 mission.

8 QUALIFICATIONS

The Consultant must meet the following requirements: has the profile below:

- The consultant must be an Electrical Engineer, or related fields with Experience in Business Administration, and must have more than 15 years of experience related to project coordination, designation, records, management of electrical network assets, in Generation, Transmission and Distribution systems;
- Must have experience that includes management of digitization projects and online monitoring of equipment and centralized database;
- Proven expertise in designing and implementing integrated management systems, including EAMS, WFM, and GIS components;
- Similar implementation in Africa;
- Must be responsible for the overall coordination of the services to ensure satisfactory compliance with the Terms of Reference requirements;
- He/she must be able to lead the project team and be able to handle the team during the review and preparation of registration, designation and use of asset management platforms;
- Must be an individual with good communication skills in the English language, both written and verbal, and a high sense of organization and responsibility;
- Ability to communicate and produce reports both in English;
- Fluency in English. Knowledge of Portuguese is an advent