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# MOZAMBIQUE

## NETWORK CUSTOMER INFORMATION SYSTEM PILOT

From August 2017 to May 2018, SRUC continued work with Electricidade de Moçambique (EdM) to pilot a Network Customer Information System (NCIS) to integrate its customer management system and geographical information system and to better understand its electricity losses through an energy balancing exercise. The pilot registered EdM’s network assets and customers in a targeted area of Maputo and laid the foundation for a national rollout.

### **WORK ASSIGNMENT SUMMARY**

The Sector Reform and Utility Commercialization (SRUC) Task Order (TO) supported Electricidade de Moçambique (EdM), the government-owned power utility in Mozambique, as it underwent a large-scale transformation to make the organization more efficient, financially viable, and operationally sustainable. Priorities of this transformation include reducing aggregate technical and commercial losses (AT&C) and improving EdM’s ability to serve its customers. The Network Customer Information System (NCIS), an initial pilot to register network assets and customers in advance of a national rollout, helped the organization move toward those goals. The NCIS pilot provided EdM with a view into the energy balance on its distribution networks by improving the data collection processes needed to measure,

manage, and identify losses as well as more efficient ways to respond to its customers. To develop an understanding of the effort required for such an ambitious and large-scale national rollout, SRUC collaborated with EdM to conduct a pilot project between August 2017 and May 2018 that registered the network assets and customers in the Magnoine B neighborhood, a small area of Maputo City.

## CHALLENGE

With EdM experiencing high losses costing the utility an estimated US\$50 million annually, there is an urgent need to better identify and mitigate the sources of these losses within the national distribution network. Improved asset and customer management and measurement capability is critical to improving this understanding as the utility prepares to connect another 400,000 customers a year through its new national electrification program. Additionally, EdM staff have minimal experience with how to reduce losses and project implementation on the scale of NCIS, as well as an understanding of the time, financial, and human resources required for successful deployment.

## APPROACH

To undertake the pilot, SRUC assisted EdM in integrating their customer management system and geographical information system (GIS), designing an operational plan to capture the location of their assets (network and customer locations), and creating ancillary technical processes for their loss management program. Design and execution of the assistance involved the following:

- Analyzed EdM's current situation and its ability to implement the pilot, conducting preparatory sessions with EdM stakeholders to define the geographic area in which to carry out fieldwork and identify EdM personnel to participate in the project.
- After identifying the pilot area, evaluated the following critical components of the pilot:
  - Physical condition of electrical equipment in the pilot area (e.g., power transformers, poles, distribution lines, etc.).
  - Isolation of the pilot area's distribution grid by ensuring the area was ring fenced.
  - Assessment of the data quality within the requisite EdM systems: its GIS (specifically, dpPower), its pre-paid metering system (specifically, Eclipse Business Edition - 3E), and its customer management system (specifically, Indra).
- Developed detailed processes and technical instructions for EdM on how to register customers and assets and how to enter and maintain data in the integrated system.
- Developed an interface to facilitate sharing of asset information between the GIS and customer management software systems.
- Identified and acquired a range of critical equipment needed to implement field work, including vehicles, GPS devices, and tablets.
- Carried out an energy-efficient LED lightbulb exchange initiative to help customers in the pilot area better manage their energy consumption and improve customer relations.
- Selected EdM staff for participation in the pilot and carried out training courses in network asset and customer registration, fieldwork procedures and proper use of equipment, as well as back office training on the newly integrated systems.
- Assisted EdM staff as they carried out customer and asset registration in the Magnoine B neighborhood of Maputo, registering approximately 700 poles and 1,800 customers.
- Using the newly collected data, conducted an energy balance exercise in Magnoine B, revealing that commercial losses in the area are approximately 40 percent and identifying key areas for improvement in the company's losses management approach.

## KEY RESULTS

The NCIS pilot resulted in several outputs that have facilitated the beginning of a successful national rollout for EdM, including:

- Delivered a **detailed set of technical procedures** for EdM, including: asset coding methodology, asset registration, customer registration, information maintenance in the GIS system, energy balance, and energy-efficient lightbulb distribution.
- Provided baseline information systems integration data, timeline, budget, and key performance indicators (KPIs) necessary to develop a **plan to register network assets and customers at the national level**.
- Provided valuable information to EdM regarding the **successes and failures of past grid improvements** and areas in need of further improvement, such as identifying that municipal street lighting was not being captured in distribution network loss totals.
- Determined through analysis of the energy balance that **system losses may be significantly higher than current EdM estimates** - Magnoine B exhibited commercial losses of approximately 40 percent.
- Provided hands-on technical and organizational training and experience to EdM staff in preparation for the national rollout.
- Facilitated EdM's complete ownership of the new procedures – EdM has **since expanded the pilot to the five city districts in Maputo City**, registering 150 distribution infrastructure assets and 38,000 customers independent of SRUC's assistance.



*Customer Registration and Light Bulb Replacement, April 2018*

## M&E INDICATORS

- Number of beneficiaries with improved energy services due to USG assistance – **7,920 beneficiaries**. (Standard Indicator: EG.7.1-1)
- Number of people trained in technical energy fields supported by USG assistance – **76 people trained (9 females, 67 males)**. (Standard Indicator: EG.7.3-2)

## COOPERATING PARTNERS

SRUC worked closely with the World Bank country office, given shared goals for the Mozambican energy sector. The NCIS pilot laid the groundwork for a national rollout funded by the \$150 million World Bank Power Efficiency and Reliability Project (PERIP). Testing the NCIS procedures, undertaking the initial software integration, and working with the field teams to carry out a pilot were critical for identifying challenges and allowing the utility to subsequently modify approaches before a company-wide investment. It also allowed EdM and the World Bank to have much clearer visibility into the budget and timeline for the projects, facilitating smoother large-scale implementation.

## FOLLOW-ON WORK

SRUC's work on the NCIS pilot was directly followed by further support to EdM in developing and deploying its first holistic community engagement strategy, "EdM com a Comunidade," which will be a central part of its national electrification plan. The community engagement strategy and roadmap will help move the company towards its goals of better orienting itself towards its customers and increased sustainable connections for residential customers.