

TERMS OF REFERENCE FOR A DIRECTED WRC PROJECT

THEME: Water Use

TITLE: Promoting the use of advanced Non-Revenue Management Solutions.

TOR NUMBER: 1010013

Rationale

There are now several new and novel ways – technical/digital//institutional/financial and other means to tackle the growing NRW challenge. Embracing advanced technologies such as smart meters and automated leak detection systems can enhance the efficiency of water distribution systems and minimize opportunities for losses. The convergence of know-how, technology, data analytics, and infrastructure management around a digital governance process can unleash remarkable efficiency gains. Today, advances in technology, such as the cloud, the industrial internet of things (IIoT), big data, artificial intelligence (AI), machine learning (ML), and digital twin empower water utilities with mechanisms and strategies to help address NRW. Some of these are including:

- Real-time monitoring and leak detection – Meters, sensors, and pressure gauges provide real-time water flow, pressure, and consumption data. Advanced analytics and algorithms analyze this data to detect leakage patterns, while ML and data modeling techniques can leak locations more accurately for more targeted repairs and minimized water loss.
- Pressure management – Because excessive pressure can lead to burst pipes and increased leakage, actively monitoring and controlling pressure levels can reduce the likelihood of leaks. Digital tools can optimize pressure in the water distribution network, ensuring it remains within the desired range.
- Predictive maintenance – Digitalization allows predictive maintenance strategies based on data analysis and algorithms. By monitoring parameters like flow rates, pressure changes, and equipment performance, utilities can better anticipate maintenance needs and proactively address potential issues before they result in significant leaks.
- Asset management – Digital platforms can facilitate comprehensive asset management, providing utilities with an overview of their infrastructure, including pipes, valves, and meters. This helps identify aging or deteriorating assets that may contribute to leakage. Utilities can mitigate the risk of leaks by prioritizing maintenance and replacement efforts and reducing NRW.

- Breaking down organizational silos – Digitalization enables more effective data sharing and integration capabilities among cross-functional departments in the utility, such as engineering, operations, maintenance, and customer service. This collaboration drives more coordinated planning and implementation of NRW reduction initiatives, shared accountability, and continuous improvement.
- Data-driven decision-making – The abundance of data collected through digital systems and organizational silos elimination enables utilities to make data-driven decisions like infrastructure investments, repair prioritization, and resource allocation.

Main Objectives

1. A scoping study to understand trends and uptake of advanced NRW solutions in the sector
2. Writing up of important case studies and best practices.
3. Development of a framework or guideline for introducing Advanced NRW.
4. Pilot the adoption of the guidelines by developing an Advanced NRW intervention strategy in three categories of Municipalities (A, B, C)

Expected Deliverables:

1. A comprehensive framework and guideline on the application of Advanced NRW solutions
2. Piloting the guide and any tool in three municipalities to develop comprehensive strategies.
3. Two webinars to share findings and results.

Total Budget: R 1 200 000.00 (Including VAT)

Year 1: R 600 000.00 (Including VAT)

Duration: 24 months