

SMART ELECTRICITY MANAGEMENT

Digitalising George municipality's electricity network.

THE BUSINESS CHALLENGE.

A smart city is a city governed proactively by decision makers informed by accurate and reliable data. The smart management of electrical infrastructure is a prerequisite for sustainable socio-economic development. With the right information in the right hands at the right time, reactive systems become proactive and planning becomes a science rather than a guessing game.

To achieve its vision of building a sustainable future for all its citizens, George Local Municipality (GLM) started a drive towards the more efficient management of its electricity distribution network. The goal was to build a comprehensive electricity master plan that would inform planning around electricity supply and demand trends, as well as feed engineers and financial planners with vital information to better manage and maintain the lifecycle of crucial infrastructure assets.

GLS Consulting and IMQS Software, both subsidiaries of the EOH Group, joined forces to offer GLM an integrated, end-to-end Infrastructure Lifecycle Asset Management solution. Built on the back of cutting-edge engineering and GIS technology, the ultimate goal was to enable engineers and financial planners to more accurately determine:

- Where and when demand for the service will develop.
- Where infrastructure assets are located geographically.
- The value of these assets and asset components.
- Whether existing infrastructure is sufficient for present and future demand.
- What weaknesses exist that may impact current and future service delivery.
- How to best address challenges to ensure that service delivery objectives are met.

THE CLIENT

George Local Municipality (GLM) is a Category B municipality located within the Eden District in the Western Cape Province. With an area of 5 191km², the municipality governs a population of 193 672, growing rapidly at a rate of 2,59% per annum. Of its 53 551 households, 91% have access to electricity for lighting.

SOLUTION

- GLS Dynamic Electricity Master Plan
- GLS SWIFT
- GLS EdiSAN
- IMQS Asset Register
- IMQS Maintenance Management Module
- IMQS Electricity Module

BENEFITS

- Centralised electricity information management system
- Geospatial representation of data
- Informed decision making and planning
- Comprehensive view of electricity infrastructure network
- Improved maintenance management

THE SOLUTION.

The master planning process aims to enable an orderly and economic expansion of equipment and facilities to meet a utility's future electricity demand with an acceptable level of reliability.

Over the last two decades, GLS has developed its own proven master-planning methodology. Geospatial load-flow models serve as master GIS-datasets. They represent the municipality's existing electricity distribution system as well as spatial development framework. GLS's load-flow modelling informs its dynamic master-planning approach. To load the models with real world demands, and convert electricity sales to consumption data, billing information is analysed by means of GLS's SWIFT software. The models are then analysed, using GLS's EdiSAN software, to identify critical areas and prioritise actions to improve the existing system. The geographic models and dynamic master plans make available the data necessary to inform refurbishment programmes and electricity demand management interventions as well as future planning.

The information rendered by GLS is uploaded to the IMQS Asset Register on a constant basis and displayed geographically on the IMQS Web platform. The Asset Register is a plugin module that ensures that the IMQS solution complies with South African legislation. It forms the backbone of an integrated system that links with IMQS's various asset and accounting software modules such as the IMQS Electricity Module and the IMQS Maintenance Management Module. Reports are easily generated, informing planning, as well as reporting to the auditor general.

The IMQS Electricity Module enables more accurate planning of future demand to ensure that the right investment is made at the right time for the right areas. Electricity-network data is used to create a data model of the existing electricity infrastructure. When the data model is combined with GIS technology, a powerful spatial snapshot of the current electricity infrastructure is rendered. This image can be viewed from different angles to assist in identifying existing gaps in the connection and supply of electricity to consumers. When the electricity network model is overlaid with the electricity demand model, it becomes a powerful tool to assist in demand planning. Demand planning ensures that the current demand is met without over-utilising current infrastructure.

The IMQS Maintenance Management Module assists in meeting the municipality's infrastructure maintenance requirements. Proven process-management technologies ensure that all maintenance tasks are attended to and nothing gets lost or forgotten.



The Module leverages the geographically referenced asset data to inform preventative maintenance interventions, work-force mobilisation and incident logging.

THE ACHIEVED BENEFITS.

The information rendered and made available by the GLS/IMQS solution plays an integral role in assisting George to become a smarter, more resilient city.

The GLS master plan is a living, geospatial document that integrates seamlessly with IMQS's Web-based infrastructure asset management software. The solution represents an end-to-end, integrated lifecycle infrastructure asset management system, where geographically referenced electricity demand and asset data are housed and kept up-to-date in one central place.

Beyond electricity, the integrated system can be applied as an end-to-end solution for the management of any asset class, including water, roads, storm water and solid waste. The consistent flow of updated data between GLS and IMQS constructs a powerful engine that keeps municipal engineers informed and makes the work of stakeholders, at various levels, more manageable and cost-effective.

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