

# Electricité de Zahlé Plugs in its GIS

**The GISEZ project has caused significant change in EDZ's daily operation and management style**

**By Jim Baumann**

In late 1999, Electricité de Zahlé (EDZ) commissioned Khatib & Alami (K&A), the Lebanese distributor for ESRI's geographic information system (GIS) software, to implement its automated mapping / facilities management / geographic information system (AM/FM/GIS). The primary goal of the project was to quickly modernize and automate the core business processes of EDZ utilizing GIS and complementary technologies.

Simply put, a GIS integrates geographic information with a database management system to facilitate the management, analysis, and display of georeferenced data.

EDZ's GIS is based on ESRI's ArcInfo and a suite of related software including Miner & Miner's (M&M) DistOps. The major part of the project was completed in just four months, which provided a major challenge for the EDZ and K&A teams.

Completing the project in four months was a self-imposed goal established so that the necessary field survey could be conducted during the summer season and crews could benefit from the favorable weather conditions at that time. It also allowed student interns to participate in this essential work. In addition, it was important to EDZ to complete batch data entry and follow up its new network modifications in as short a period of time as possible.

The EDZ service area is in the Beqaa Valley and covers about 230 km<sup>2</sup>. It

extends over 21 cadastral areas and includes 17 municipalities, serving about 34,000 customers. Like most rural areas in Lebanon, the distribution system is primarily serviced by overhead, lines.

The GIS includes five priority applications that meet the immediate business needs of EDZ.

The AdHoc application is comprised of a number of different modules that automate the collection of some of the frequently required statistical, information needed for managerial and technical purposes. Basic functions address electrical consumption and record mismatches between spatial and tabular entities. Some of the primary functions performed by the application include general statistics, municipality statistics, mismatch between spatial and tabular entities, types of consumption, customer location, and service connection statistics.

The Collection Management application monitors energy flow at the distribution level by comparing consumption at different checkpoints. It allows the utility to calculate technical and non-technical losses based on installed meters' readings at different levels of the network and radial power flow calculations. Moreover, the application enables the user to study consumption variations and to produce a set of indices and charts. The application interfaces with EDZ's existing Customer Information System and Billing Information System and provides an Arab-language interface to display customers' names in Arabic.





The Map Product application replaced manual methods for standard map production. It also allows the user to produce high quality color plots in standard paper sizes (AO, A3, A4) for either standard map scales (1:500, 1:1000, 1:2000, 1:5000) or scale-independent plots.

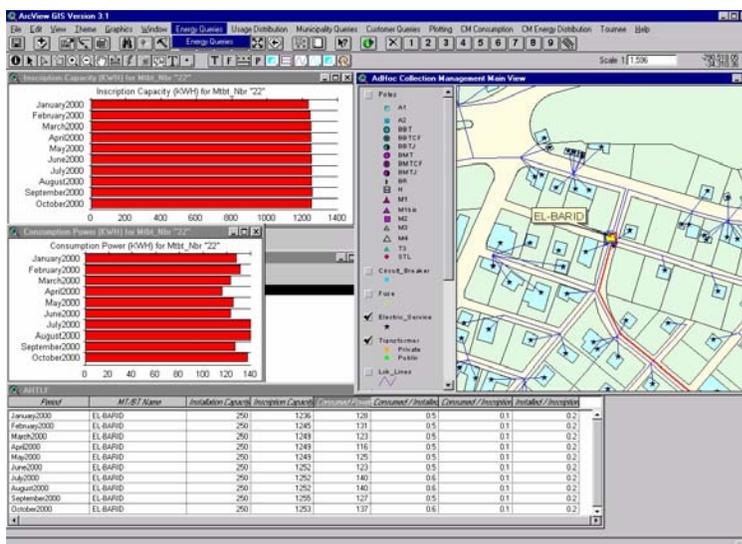
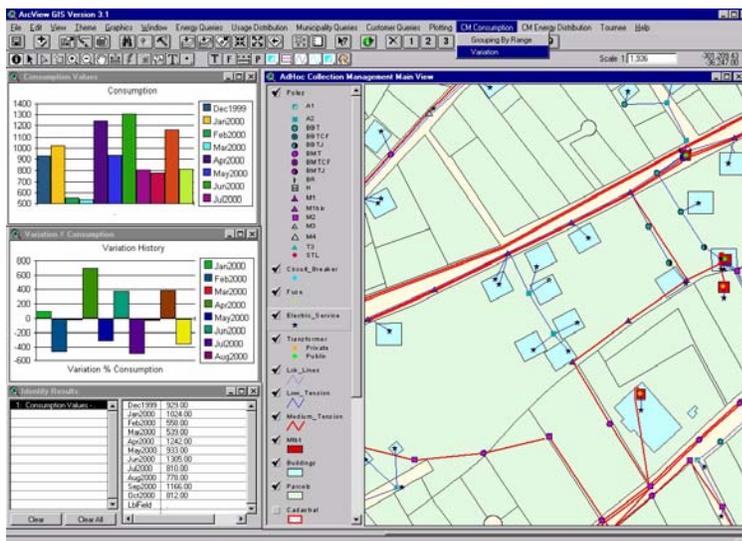
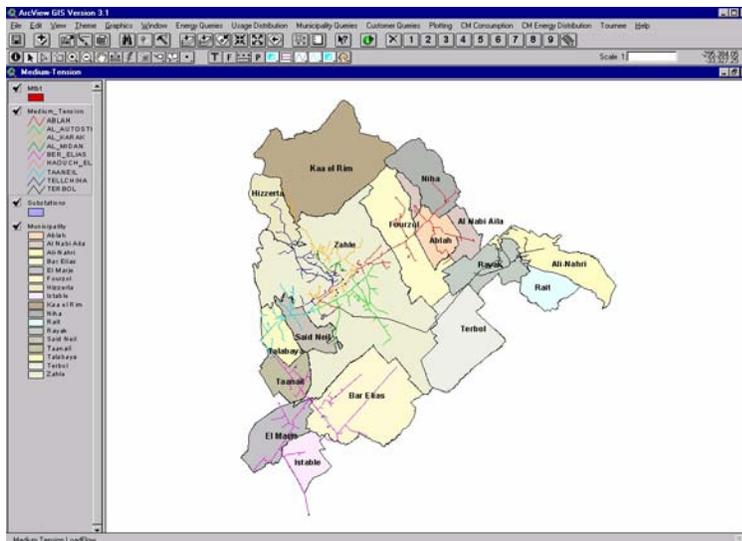
The Map Editor application goes beyond simple editing and drawing capabilities. It includes a broad set of network-related modules that help preserve electrical consistency, enhance batch processing, and automate some reoccurring tasks. Even though the customer and billing information systems are not directly linked to the other applications, every customer of EDZ is identified by a unique value or tag generated by the Map Editor application. The unique identifiers are used by the Customer Services team to maintain a globally interrelated system.

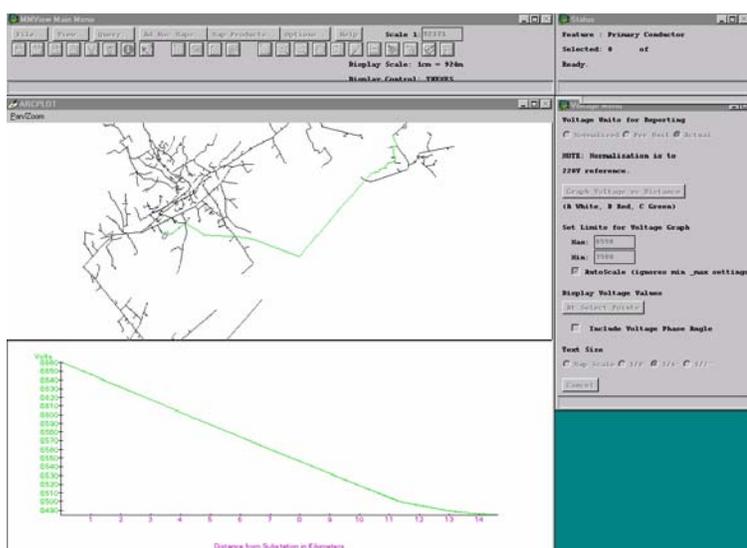
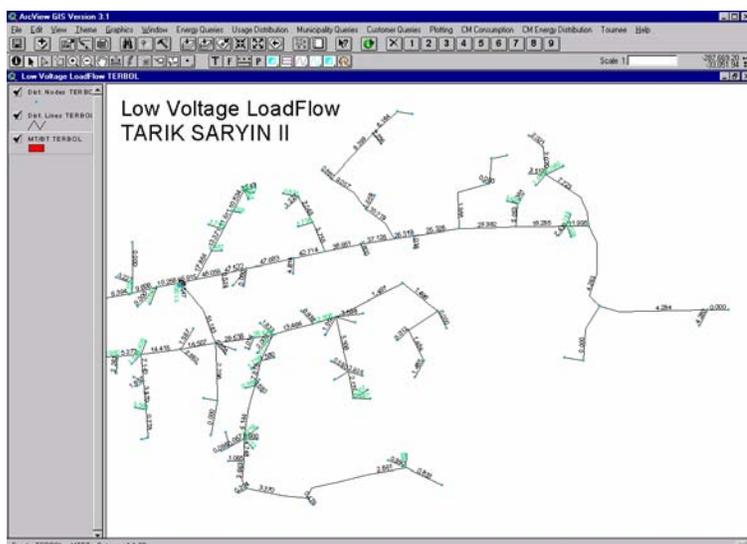
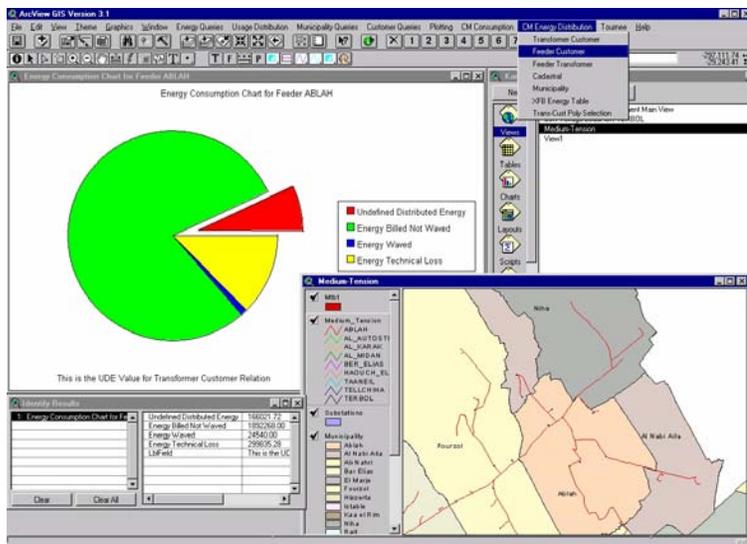
DistOps is a load flow application developed by Miner & Miner that is ArcInfo-based. It is used for analyzing utility distribution maneuvers in planning and operation modes. A Distribution Load Flow (DLF) module was specifically written to extend the analytical capabilities of the application to the low voltage side of the network and to prepare input files for the Collection Management application.

New applications under consideration may include a module to record the maintenance history of every device on the network, as well as provide regular prescheduled maintenance reports on those devices. Employees at EDZ are making good use of the GIS technology in order to provide system integrity between a variety of departments including Inventory, Customer Services, Engineering, and Accounting. Customer Service readily adopted the technology, following the department to produce customer site maps more easily and quickly.

Mr. Assaad Nakad, Director General at EDZ, indicates that before implementing the GIS at Electricity of Zahlé (GISEZ) project, mapping and tracking procedures there were "blind and deaf."

"In our pre-GIS era, we were heavily dependent on manual drawing. Basing our technical studies on this information was very time consuming and often the results were not as precise as we would like. Additionally, there was little interaction between departments and we had limited control over our network operation and equipment," elaborated Nakad. "With our new GIS-based solution, we have been able to simulate the electric power system, which has resulted in a better analysis of data, the ability to monitor the network performance, and make precise calculations of fraudulent losses of energy. This has allowed us to expand our range of products and services and provide





more up-to-date and accurate information, which leads to better decision-making," he continued.

The GISEZ project has caused a significant change in EDZ's daily operation and management style. It is enabling EDZ to meet the challenges of the 21st Century, which are driven by automation, information, and communication technologies, with consistency and flexibility. In addition, it is providing EDZ with a competitive edge by producing higher quality products, applying fact-based management with more up-to-date and accurate data, improving coordination between departments, and increasing productivity; which allows more time to be devoted to data analysis, rather than data collection. Ultimately, this allows EDZ to provide better service to its customers.

Concludes Nakad, "I foresee a technologically advanced future for GIS at EDZ. GIS is very dynamic and can interface with many other systems such as SCADA and GPS. GIS may soon provide us with an interface to centralized remote monitoring, so that we can detect faults that may occur in the electric network and then pinpoint the geographic location of those faults. This will allow us to immediately dispatch repair crews to minimize disruptions to the service."

*About the Author*

*Jim Baumann writes about international CIS-related topics for ESRI. He has written article's on various aspects of the computer graphics industry and information technology for more than 15 years.*

