

Spatial Tech—GIS for the Utilities Industry

GIS technologies are becoming key to managing services and resources.

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fixed—now!

Utility companies have some of the most demanding customers around. They expect to be able to turn on the lights, watch television, log onto the Internet, cook on their gas stoves and call all of their friends and neighbours. When the power goes out, they wanted it

To meet the demands of their customers, utilities are using GIS technologies now more than ever. For utility companies, GIS has become the *de facto* tool of choice for creating, organizing and managing geospatial information.

Unrealistic Demands

When it comes to implementing a GIS system, utility companies have very little room for error. They can't afford to take chances—if the software crashes or is inadequate for addressing the diverse demands of a particular company, the results can be disastrous. For example, an entire power grid could go down simply because of a software glitch.

Utility companies don't have the luxury of implementing GIS systems that take years to deploy, either. Customers are very demanding, and they expect electricity, gas and other utilities to be available on-demand and at an affordable price. When a system is installed, utility companies can't afford failure. They need to install an enterprise GIS solution that not only meets their immediate needs but is scalable and flexible enough to meet future needs as well. Predicting future needs can be extremely difficult, though, because the utility industry is changing so quickly.

The way that utility companies use GIS has changed significantly in recent years. There has been a shift from departmental solutions, in which three or four people use the software, to enterprise solutions, where the data is accessible by thousands of people.

The electric utility industry is expected to double in size during the next two decades, and geospatial technology will need to improve significantly to deal with this growth. The gas industry is growing at a rapid pace and is expected to continue to be the fastest growing type of energy production in the world. Many of these changes in the United States are the result

of greater involvement by the federal government in the gas industry. Gas companies are required to manage geospatial data, and new regulations are very specific about what data is required. As a result of these new regulations, gas companies are starting to integrate geospatial data into all parts of their organizations.

Applications

Utility companies come in a wide array of sizes, shapes and missions. Austin Energy of Austin, Texas, is the tenth largest public power utility in the nation, and it offers what may be the most comprehensive residential and commercial energy-efficiency program in the nation. It serves 360,000 customers and a population of more than 800,000 within the city of Austin and surrounding counties.

Austin Energy is known for creating one of the top performing renewable energy programs in the country. It owns the nation's first and largest green building program. The company also has developed new processes for managing resources and addressing the forces that drive the industry, and these processes are based on GIS technologies.

The GIS application that Austin Energy uses to meet their needs is GE Energy's Smallworld. GE Energy introduced Smallworld GIS more than a decade ago. Smallworld's core architecture is scalable, and this approach helps to ensure that a company can make changes as it grows and expands its database. Companies also have to adapt to changing business environments that require new processes and procedures.

One reason that Smallworld has been so popular is that GE Energy has such an incredible wealth of domain knowledge. GE Energy is one of the world's leading suppliers of power generation and energy delivery technologies and reported a 2006 revenue of \$19 billion. GE manages more oil and gas transmission pipelines than any other provider, so it should make sense that its GIS software does a great job of meeting the needs of utility companies.

Other utilities that are using Smallworld include CAT Telecom Public (Bangkok, Thailand) and Wisconsin Public Service (WPS, Green Bay, Wisconsin). CAT Telecom, which previously was the government agency Communications Authority of Thailand, owns Thailand's international telecommunications infrastructure. The company has a widespread optical fiber cable network and the fastest communication network in the country and provides a wide range of telecommunication services both locally and globally.

In 2003, CAT Telecom made the decision to develop an integrated system that would bring together all of its existing systems using Smallworld as its foundation. The company is

expanding its core infrastructure network to cover all provinces and major districts, increasing channel capacity, constructing a submarine optical fiber cable network, developing wireless broadband access and expanding the existing IP (Internet protocol) core network and Internet gateways. New telecom companies will have to lease CAT's infrastructure or build their own.

Just as in the United States, regulations in other countries affect the decisions that utility companies make. In 2006, the liberalization of the telecommunications sector from the World Trade Organization framework was initiated. This liberalization certainly will influence utilities, including CAT Telecom, which is one of two organizations granted telecommunication operation licensing.

Companies such as WPS are implementing GIS to meet the demands of its customers. WPS is a natural gas and electric utility that serves an 11,000-square-mile area in northeastern and central Wisconsin and part of upper Michigan. It provides domestic and commercial lighting and energy for more than 450,000 customers. The company has a network of more than 20,000 miles of electric distribution lines and more than 5,000 miles of gas main, and these numbers are growing daily. In an effort to meet growing demand for electricity, WPS is partnering with two other companies to build a 220-mile transmission line that connects Duluth, Minnesota, to Wausau, Wisconsin. The groundbreaking for the generator was in November 2004, and the plant is expected to be operational sometime in 2008. WPS has been merging with other gas and electric companies in Minnesota and Michigan as well.

WPS implemented Smallworld in 2001, and one of the first things it did was set up the new system and convert existing data into the Smallworld system. It took less than two weeks to perform both tasks, which is an amazingly fast turnaround. WPS is expanding this base by using Intergraph's OMS (outage management system), based on InService technology, to help improve reliable and affordable service. OMS makes it easier for WPS to restore power to its customers after an outage or other emergency by allowing for a centralized dispatch of all gas and electric emergency work. WPS is looking at integrating additional pipeline integrity tools as well.

Most utility companies use GIS for mapping, and many are using the technology for more specific applications as well. Some use GIS for tax and compliance reporting, and others are seeking to reduce the amount of work generated by on-call systems. In the gas industry, an innovative use of GIS involves the implementation of automated vehicle-locating systems that track leak-survey routes. The one sure thing in the utility industry is that the use of geospatial technologies continues to increase in both number and usage diversity.

Move to Oracle

In the world of digital technologies, change is inevitable. Despite the success of Smallworld, GE Energy is introducing new products based directly on Oracle platforms instead of the Smallworld GIS platform. Oracle Spatial duplicates much of the functionality that is available in the Smallworld platform, so GE decided to develop applications directly in Oracle (instead of going through Smallworld). GE hasn't developed an official name for its new Oracle-based application platform, so for the time being it's called Project OAI (Oracle Application Initiative). GE Energy plans to continue development for and support of the Smallworld platform.

The primary reason for developing GIS applications direction on Oracle Spatial and Oracle Fusion Middleware is that the approach is much more efficient and cost-effective. It provides a much greater level of functionality as well. Because of these reasons, you'll probably see all software companies that develop geo-spatial applications move toward working directly with Oracle Spatial over the next five or six years.

Utilities for the Utilities

As the utility industry continues to grow, it will depend more and more on GIS technologies to manage services and meet customer needs. As a result, an increasing number of utilities will look to such programs as GE Energy's Smallworld and Oracle's Spatial and Fusion Middleware to effectively manage their business.

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