

Utility GIS Solutions for
Gas Distribution Operations
Electric Distribution Operations
Gas Engineering
Electric Engineering
Gas Communications
Line Locating
Leak Survey
Distribution Dispatching
Land and Right-of-Way
Surveying and Mapping
Meter Reading
Streetlight Operations and Maintenance
Marketing



GIS: Technology for Your Enterprise



CenterPoint Energy

GIS: Technology for Your Enterprise



CenterPoint Energy, Inc., headquartered in Houston, Texas, is a domestic energy delivery company that includes electricity transmission and distribution, natural gas distribution and sales, interstate pipeline and gathering operations, and more than 14,000 megawatts of power generation in Texas. The company serves approximately five million customers primarily in Arkansas, Louisiana, Minnesota, Mississippi, Missouri, Oklahoma, and Texas. Assets total nearly \$19 billion. CenterPoint Energy became the new holding company for the regulated operations of the former Reliant Energy, Inc. in August 2002.



With more than 11,000 employees, CenterPoint Energy and its predecessor companies have been in business for more than 130 years. For more information, visit the CenterPoint Web site at www.centerpointenergy.com.

Energy Delivery

- Electric transmission and distribution
- Natural gas distribution
- Pipelines and field services

GIS Objectives

- Better information
- Faster response
- Reduced costs
- Increased revenues
- Enhanced business processes



CENTERPOINT

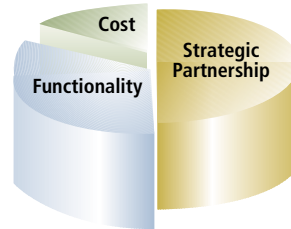
GIS Project History

CenterPoint Energy has already successfully completed three phases of its GIS implementation. In Phase One, ESRI worked with CenterPoint Energy to develop the functional requirements of the GIS gas applications. Together, ESRI, Miner & Miner, and CenterPoint Energy then designed the corporate relational data model based on ArcFM™ 7.2 software, and ESRI provided training on this new platform. Phase Two involved the implementation of ArcFM 7.2 at CenterPoint Energy Arkla. This included the development of ArcFM RuleBase Engine and data migration. Phase Three involved data migration and implementation of ESRI® ArcInfo™ 8.0.2 and 8.1.2 at CenterPoint Energy Entex, CenterPoint Energy Houston, and CenterPoint Energy Arkla. This phase also included the implementation of gas application functionality needed to replace the previous environment as well as the implementation of corporate object data models.

Data migration was performed as a series of projects representing several geographic areas. Functional customization was divided into four stages, with the first three stages focusing on the requirements prioritized for the CenterPoint Energy Entex and CenterPoint Energy Arkla implementations. The fourth stage will focus on the remaining requirements for CenterPoint Energy Minnegasco. Custom components were delivered to CenterPoint Energy on a weekly basis, and training of users has been completed.

Throughout this project, ESRI provided technical project management and support, and Miner & Miner provided development and implementation services. Knowledge transfer training was also provided to CenterPoint Energy's experienced staff, allowing them to quickly learn ESRI's exciting new object-oriented environment.

Considerations for Selecting a GIS



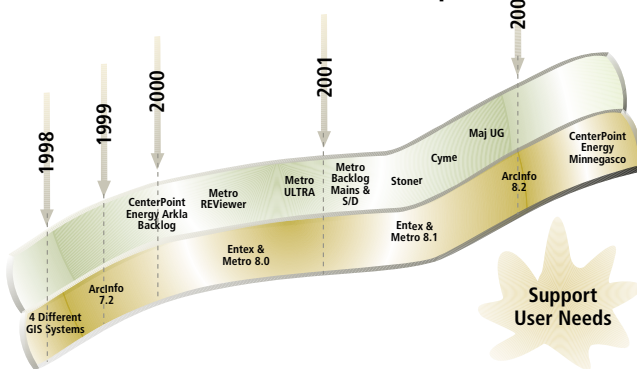
ESRI's Qualifying Marks

- ✓ World's leading GIS software company
- ✓ Strong reputation
- ✓ Highest R&D investment
- ✓ Many proven business partners
- ✓ Highly diversified market
- ✓ Open functionality of software
- ✓ IT standards in software
- ✓ Multiple resource leverage
- ✓ Strongest cost advantage

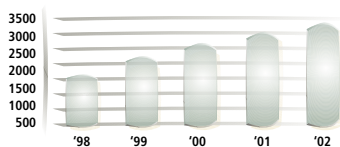
Standardization

- GIS supports strategic and tactical decision making.
- Provides means to analyze spatial and nonspatial data together.
- Combines databases (nonspatial data) with basemaps (spatial data).
- Complex spatial operations, such as network analysis and routing, are handled well in a GIS environment.
- Economic and strategic benefits from replacing four existing geographic information systems with one enterprise system.
- Common gas, electric, and land base data models.
- Common suite of GIS applications.
- Single GIS to SAP interface.
- Common gas analysis application using Advantica Stoner software.
- Common development environment.
- Common system architecture, design, and implementation.

GIS Evolves in the Enterprise



Number of Users Supported



GIS Is the Foundation for CenterPoint Energy

Applications

CenterPoint Energy uses a wide scope of applications to best service a wide array of customer needs. Custom-designed interfaces both reduce costs of data maintained and increase the level of data integrity.

CenterPoint Energy uses GIS throughout all of the operation parts of the organization. As part of the company's enterprise implementation, it has created a central organization that manages the relationship with ESRI as well as all the applications, data models, and work flow processes associated with maintaining data in the GIS. A variety of applications contribute to the strength of the comprehensive GIS.

Implementing base asset information is the platform from which additional applications and business values are derived. The more integration, the more value for decision making.

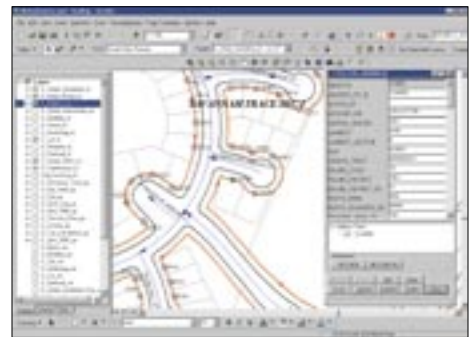
Land Management

CenterPoint Energy's Land & Right of Way Division acts as property manager for 70,885 acres of land within the Houston, Texas, metro area. In this role, the goal is to maximize revenue and nonrevenue benefits of real property assets, prevent adverse effect to primary use, minimize risk and liabilities, and minimize cost to manage and own property. Critical to the efficient management of this property is the ability to view from the desktop as much information about the property as possible. In addition to being costly, timely field visits to all of the company's holdings are physically impossible. CenterPoint Energy's GIS makes required information available. Data, such as how the asset was purchased, current uses of the asset, the physical boundaries of it, and the acreage within the asset, is readily available to the agents. GIS assists Land & Right of Way in managing approximately \$9 million of annual revenues. **Estimated Land & Right of Way savings in labor costs from use of the GIS data is approximately \$80,000 per year.**



The Addressing Application

The Addressing application is a custom application written to facilitate the company's responsibility for assigning new Houston area addresses. After the addresses are created in GIS, information about each address is automatically transferred to the customer information system, which precreates new customer accounts before the customer requests service. In addition to the address, transferred information contains the results of polygon processing and coordinates used for map-based dispatching. **Automation of the data feed to the customer information system saves approximately \$50,000 annually.**



The Pole Attachment Application

The Pole Attachment application is an in-house design used for managing pole attachments from cable TV and communications companies. CenterPoint Energy uses the GIS database to track and manage the number of communication attachments in many different ways. Reports of attachments by area, owner, type, etc., are easily generated in text or map format. Legal text and map images are merged together to produce a legal contract document that shows the specific poles leased to a communication company within the area on the map. The GIS data is also used in producing pole counts and generating lease attachment billings. **Use of GIS data and the pole attachment application assists CenterPoint Energy in managing approximately \$4 million in annual revenue.**





Underground Locating and Ticket Research Application (ULTRA)

During 1998–1999, the CenterPoint Energy Underground Locating Division recognized a rapid increase in requests to locate underground facilities. That growth, along with the acquisition of a gas company and more facilities to be located, gave CenterPoint the opportunity to identify economies of scale in its Underground Locating business process. The result of that effort was ULTRA, a system that integrated GIS, new technologies, and process reengineering to **save CenterPoint Energy \$1 million in its first year of implementation**. Savings were achieved by using ESRI MapObjects®, supported by data from a very large ArcSDE™ geodatabase, to produce digital maps and processes that resulted in fewer field locate queries being required and increased efficiencies in the locates that were performed.



Streetlight Conversions

CenterPoint Energy uses a custom application to facilitate customer requests for streetlight conversions. Users create a selection set of streetlights from ArcMap™ via the Interactive Select tool or by spatial constraint. The lights are automatically assigned a default light type to be converted to, which can be modified as required. After the new light types have been confirmed, the information is automatically sent to a streetlight work management system database, and a work sketch is automatically generated for maintenance crews to perform the work. After completion of work in the field and subsequent updating of the streetlight work management system, the changed attribute information is automatically updated in GIS, eliminating manual digitizing. **Process changes from this automation resulted in an annual savings of approximately \$40,000.**



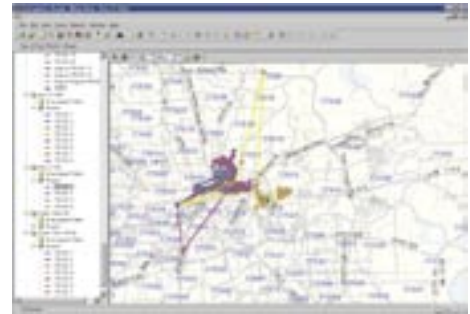
Meter Rereads

ArcLogistics™ Route is a commercial off-the-shelf application that can be used right out of the box. The route management offered by ArcLogistics Route provides CenterPoint Energy with an efficient means of handling meter rereads. Inconsistent meter readings are kicked out of two separate billing systems (gas and electric) daily. In the past, the gas and electric rereads were handled separately. Now both lists of meter rereads are processed with ArcLogistics Route for combined processing and efficient routing. With the merger of gas and electric meter rereads and ArcLogistics Route, **CenterPoint Energy has realized annual savings of \$40,000 in reduced overtime and fleet costs.**

Tools

Circuit Section Assignment Tool

The Circuit Section Assignment tool was developed to support updates of the circuit section identification number for all electrical features connected to a selected circuit section. The Circuit Section Assignment tool operates on one or many circuit sections at a time. To begin processing, the user first selects a circuit section and assigns the identification number. Results of update tasks are listed in a progress box. The update process “walks” the circuit section features, finds connected features (such as fuses, primary conductors, transformers, and other connected electrical devices), and assigns the circuit section identification number to each of them. The user can also interrupt the progress at any time to terminate the update. Once processing is complete, the tool highlights all features updated by the assignment process for visual verification.



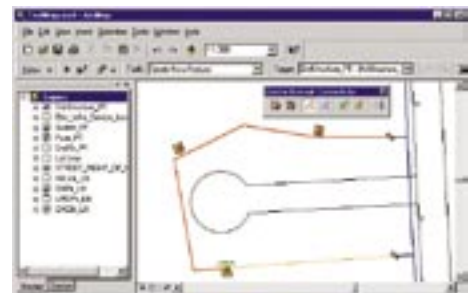
Connectivity Tools

Custom Electrical Network Connectivity tools were developed for CenterPoint Energy by Miner & Miner to create and manage network features. For example, to create an underground residential distribution (URD) loop with padmount transformers, URD cable, and fuses at riser locations, the user first places new transformers. Next, the user places the URD primary conductor line so that it snaps to the existing overhead circuit line and runs adjacent to the padmount transformers. Third, the user selects the transformers to be connected and then decides on a search distance, whether to rotate the transformer symbols to align parallel to the connected URD primary, and whether the transformer will move from a fixed distance from the conductor line. When finished, the user can confirm that the new transformers are connected to the network by using the trace tool (see below). Other functions include not only the ability to add fuses in a fashion that meets CenterPoint Energy's conventions but also the option to operate transformers as open switches.



Electric Network Tracing

Electric Network Tracing tools allow tracing functionality customized for CenterPoint Energy's specific needs. Named circuits can be traced by entering the assigned circuit name or by clicking on any span of conductor along the circuit. Feeder sections can be traced by entering the section name. URD loops can be traced and zoomed to by entering the fuse identifier for the fuse feeding the loop or by entering the identifier for one of the transformers on the loop. Trace results identify OPEN URD transformer elbows and OPEN/CLOSED statuses of fuses and switches. These tools and the information they provide enable dispatchers to direct field activities, and they provide a method of checking for proper connectivity.



Cathodic Protection

Cathodic Protection Tracing tools support the tracking, monitoring, scheduling, and defining of the corrosion protection necessary for underground facilities. In addition to performing traces between insulated fittings, length of pipe is automatically calculated for ease of reporting, eliminating the need for additional queries.

Gas Outage Analysis

The Stoner Interface application is used by gas engineers and long-range planners. Computer pipe flow simulation models are created in Stoner from extracted gas pipeline facility data and related attributes that exist in the GIS. Easy accessibility to the GIS data and transferability via this tool enable CenterPoint Energy to **save valuable time in performing network analysis on any part of the service area.**



Supporting Cast

ADVANTICA STONER

Advantica Stoner

Advantica Stoner developed a set of procedures and tools for building and maintaining CenterPoint Energy's detailed gas distribution system models from its ArcGIS™ 8 environment. These tools included the creation of a custom application (DataPrep) used to extract GIS data and format it for Advantica Stoner's off-the-shelf MiddleLink product, which formats data for SynerGEE® models. As an addition to DataPrep, CenterPoint Energy required that the application also extract loads to be assigned to the SynerGEE models based on rate classes stored in ArcGIS. This project also included development of a QA/QC tool that CenterPoint uses to check for connectivity errors in the GIS based on user-defined tolerances. For more information on Advantica Stoner, visit www.stoner.com or call 713-626-1600.



CES International

CES International teamed with ESRI to deploy its Centricity operations resource management (ORM) system to enhance CenterPoint's customer service. The Centricity ORM software system includes an outage management solution and modules supporting enhanced network reliability and customer service including switching management, crew management, customer service reporting, power flow, and storm management. Centricity also includes an Internet data warehouse engine that feeds Internet portals supporting real-time executive, media, customer, and regulatory relations reporting via the Internet. The Centricity deployment for CenterPoint Energy's electric operations also incorporates CES International's InterSys Enterprise Application Integration solution to integrate operations applications including a graphical information system from ESRI, mobile workforce management from MDSI, and SCADA systems from Siemens and ESCA. For more information on CES International, visit www.ces.com or call 800-450-0266.



FileNET
The Substance Behind eBusiness™

FileNET

FileNET solutions provide consistent and broad access to diverse plant information to achieve multiple plant benefits of scale from consolidation. They reduce plant outage and generation downtime; their asset information is easily accessed for analysis, maintenance, and improvement; and they improve technical staff efficiency. Solutions capture and organize plant documentation to gain control over asset information. Furthermore, FileNET solutions can assemble all customer documentation and make it accessible to CRM and CIS systems. Learn more about FileNET at www.filenet.com or, in the United States, call 714-327-3400.



GIS Technology, Inc.

GTI

GIS Technology, Inc. (GTI), produces value-added software for users of ESRI's GIS and FileNET's document management software products. Typically, documents maintained in a document management system are inaccessible from outside the document environment. Conversely, the managed documents have no spatial relations. Consequently, there is no way to dynamically link documents and map features. Integrated document management (IDM) for GTI designed REViewer to unite the GIS environment (GTI View) with the document management environment (Panagon IDM), providing increased functionality for both sides. Learn more about GTI at www.gistech.com/gis/mgtisoftware.htm.



Miner & Miner

Miner & Miner implemented an enterprise GIS at CenterPoint Energy. Miner & Miner's ArcFM product has become a mainstay utility industry GIS. Miner & Miner developed tools specifically to support CenterPoint Energy's data maintenance and analysis during the course of the implementation. Miner & Miner provided the CenterPoint Energy GIS staff with a complete set of tools to view, edit, map, model, and manage facility and land base spatial data in such a multiutility context. The Circuit Section Assignment and Electric Connectivity tools are examples. Visit Miner & Miner at www.miner.com.

Who Uses GIS at CenterPoint Energy?

Volume

Length of Network	135,000 km
Number of Users	3,300
Number of Customers	Nearly 5,000,000
Number of Editors	200
Concurrent Editors	100
Number of Viewers	3,000



Technology Supporting the Enterprise

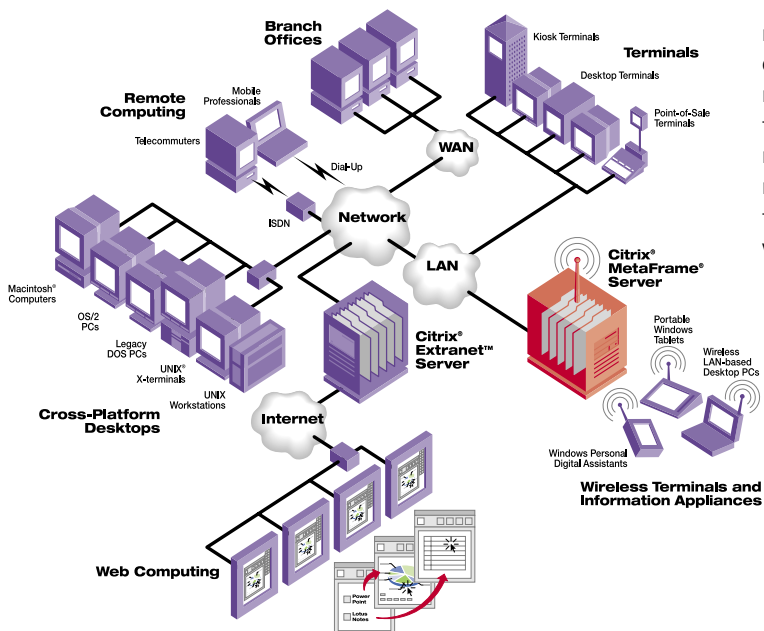
REViewer

The REViewer application is a customized MapObjects application built by GTI. REViewer is used on laptops and desktops across the company. More than a thousand users throughout the organization, including engineers, technicians, and management, use this application to access data provided by the GIS. The number of users is expected to double within the next year. This lightweight application allows users to access GIS data in a format that is easy to use and that provides a fixed amount of functionality for doing queries, viewing an area, redlining, plotting, and batch plotting.



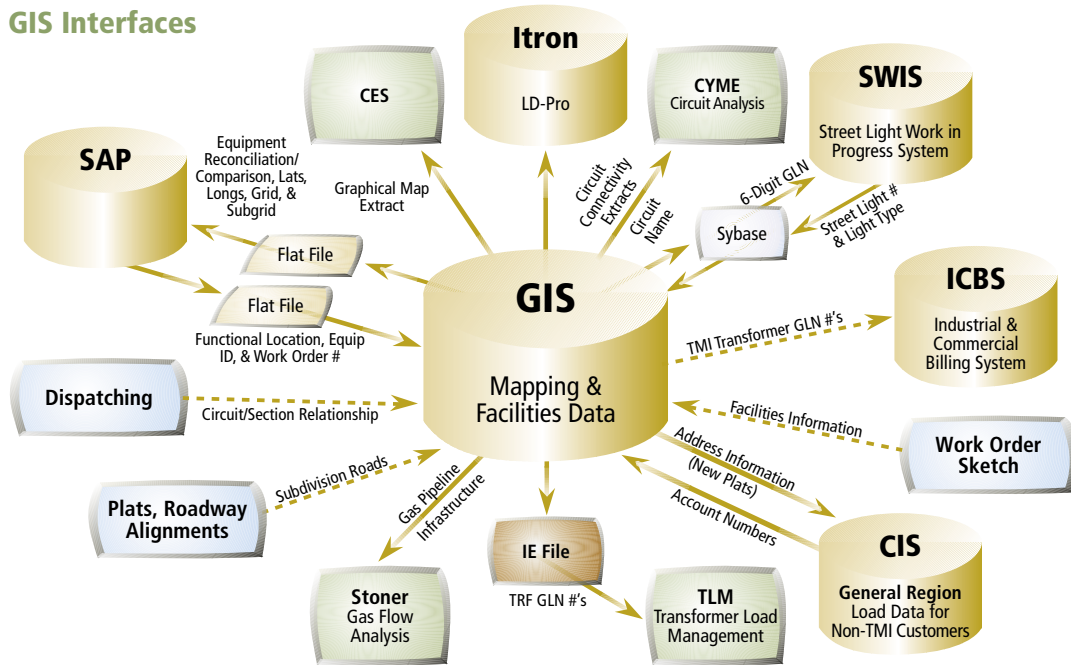
Citrix Systems, Inc.

Citrix® Systems, Inc., provides server-based computing solutions that address the information access needs of users and application management issues facing IT departments. Using MetaFrame XP™ and Citrix NFuse® Classic software in conjunction with Microsoft Windows Terminal Server (WTS), CenterPoint Energy operates a unified server farm through which it delivers Web access to interactive applications. The Citrix MetaFrame XP environment running over WTS allows editors to connect to the ArcFM editing environment from a variety of terminal devices so they can access resources from off-site locations. Not only are internal users able to connect to applications on the WTS farm through the local network, but users can also access the system using the Internet, enabling them to work from home or even from international locations. Find out more about Citrix solutions by visiting www.citrix.com or in the United States call 1-800-393-1888.



Interface Systems View

Custom-designed interfaces both reduce costs of data maintained and increase the level of data integrity. Since all the company data is currently maintained in a single location, the interface design feature enables access into the GIS from multiple applications. The data can be easily transferred from one location to another.



SAP Interface

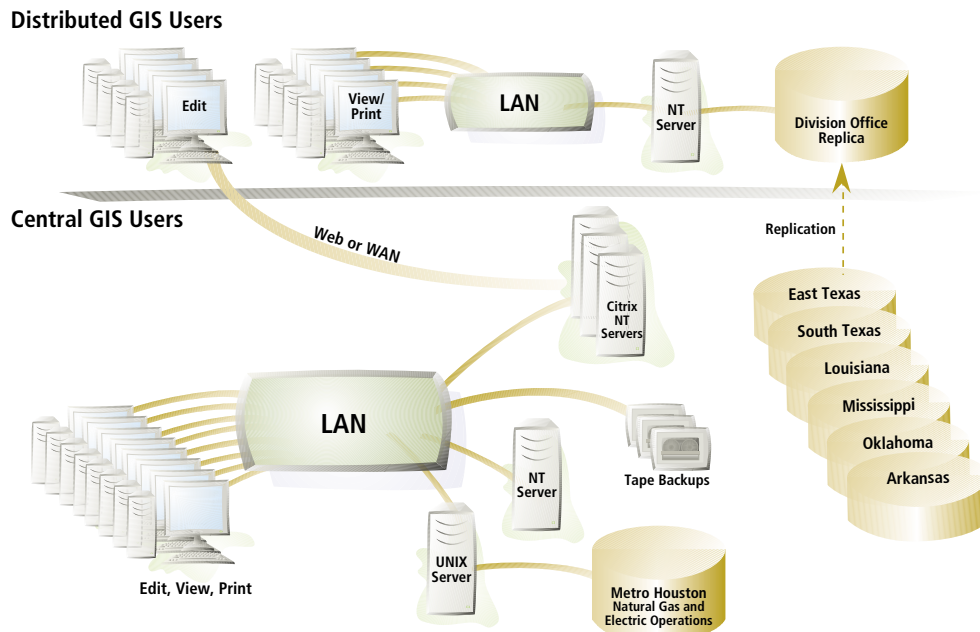
"From an enterprise standpoint, CenterPoint Energy has standardized on several major software packages such as ESRI, SAP, MDSI, and FileNET," says Richard Klapper, manager of technical support at CenterPoint Energy. "With the entire corporation standardizing on these packages, only one set of interfaces, such as the one with SAP, needs to be written to allow information to flow between various functions within the company. With a standardized ESRI approach for GIS, we can leverage developments by one group within the other groups at significant savings." CenterPoint Energy has already succeeded in leveraging the consolidation by using the electric and land database models developed for its domestic companies in one of its South America electric distribution companies.

The CYME Interface

The CYME Interface is an application that extracts electric distribution circuit data from the GIS database in the form of a text file. This text file is then run through a conversion program that adds customer load, switch status, and substation transformer data and converts the data into a format suitable for the CYMDIST load flow program. The CYMDIST programs use the converted data and preexisting equipment tables to create electric distribution circuit models for voltage drop and short circuit analysis as well as long- and short-range electric distribution planning.

Architecture

CenterPoint Energy's GIS is built for the enterprise and provides easy access and easy maintenance.



Client Machines

Editors	PC Compaq® PIII on Windows NT®, 650 MHz, 256 MB RAM
Editors (Citrix) and Viewers	PC Compaq PII 333 MHz, 128 MB RAM

Hardware Configuration

LAN	100 MB switched Ethernet
WAN	From 256 KB to multi-T-1, according to the site

Software in Use

Logical Database	ArcSDE 8.2
DBMS	Oracle® 8.1.7
ESRI Web Server	ArcIMS®
Miner & Miner	ArcFM
Standard ESRI Platform	ArcGIS 8.2

Servers

Data Servers	One Sun Enterprise 4500, 12 processors, 400 MHz, 8 GB RAM, two Compaq 6500R, four processors, 500 MHz, 4 GB RAM
Metaframe	Five Compaq 6500R, 4 processors, 400 and 500 MHz, 3 GB RAM
Web	Compaq 6400R, 2 processors, 550 MHz, 1.5 GB RAM

Looking Forward

Building on its GIS foundation, CenterPoint Energy plans continued development of integrated solutions, such as additional interfaces with SAP, outage management, document management, integrated gas and electric design, design optimization using Itron's LD-Pro, and mobile solutions that will also take advantage of wireless technology.



For more than 30 years ESRI has been helping people manage and analyze geographic information. ESRI offers a framework for implementing GIS technology in any organization with a seamless link from personal GIS on the desktop to enterprisewide GIS client/server and data management systems. ESRI GIS solutions are flexible and can be customized to meet the needs of our users. ESRI is a full-service GIS company, ready to help you begin, grow, and build success with GIS.

Corporate

ESRI
380 New York Street
Redlands, California
92373-8100, USA
Telephone: 909-793-2853
Fax: 909-793-5953

For more information
on ESRI, call

1-800-447-9778

(1-800-GIS-XPRT)

Send e-mail inquiries to

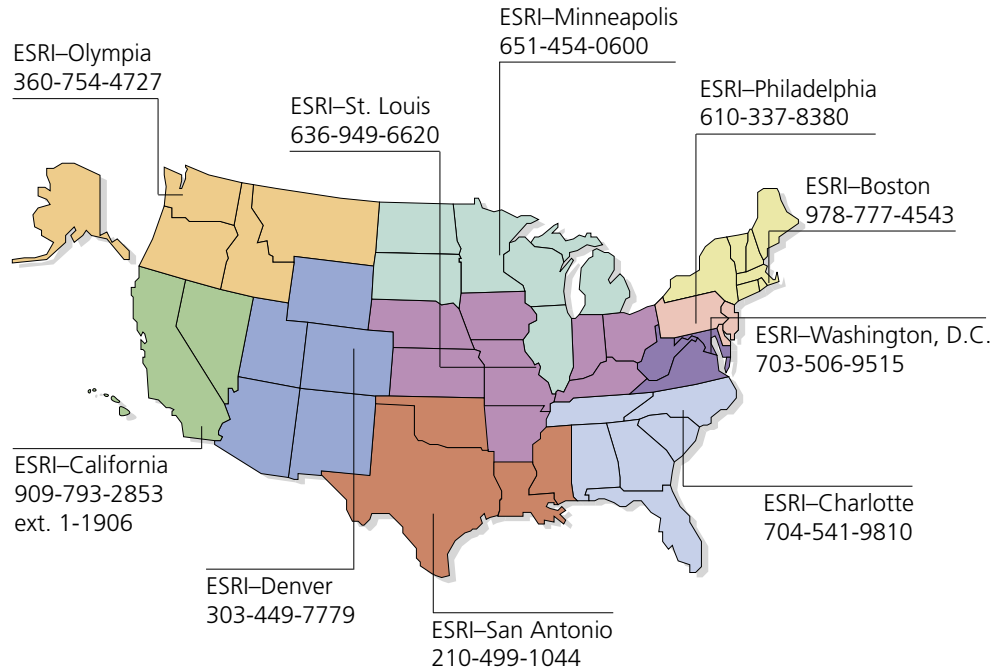
info@esri.com

Visit ESRI's Web page at

www.esri.com

Outside the United States,
contact your local ESRI distributor.
For the number of your distributor,
call ESRI at 909-793-2853,
ext. 1235,
or visit our Web site at
www.esri.com/international

Regional Offices



International Offices

Australia 613-9867-0447	Germany/Switzerland 49-8166-677-0 41-1-360-2460	Japan 81-3-3794-6681	Singapore 65-742-8622
Belgium/Luxembourg 32-2-460-7480	Hong Kong 852-2730-6883	Korea 82-2-571-3161	Spain 34-91-559-4375
Bulgaria 359-2-964-0850	Hungary 361-428-8040	Netherlands 31-10-217-0700	Sweden 46-23-755-400
Canada 416-441-6035	India 91-11-620-3802	Poland 48-22-825-9836	Thailand 66-2-678-0707
France 33-1-46-23-6060	Indonesia/Malaysia 62-21-570-7685 603-7874-9930	Portugal 351-2-1-781-6640	United Kingdom 44-1296-745-500
	Italy 39-06-406-96-1	Romania 40-1-231-13-81	Venezuela 58-212-285-9394



Place ESRI business partner or distributor address here.

Copyright © 2002 ESRI. All rights reserved. ESRI, ArcIMS, the ESRI globe logo, ArcSDE, MapObjects, ArcGIS, ArcMap, ArcLogistics, ArcFM, ArcInfo, @esri.com, and www.esri.com are trademarks, registered trademarks, or service marks of ESRI in the United States, the European Community, or certain other jurisdictions. Other companies and products mentioned herein are trademarks or registered trademarks of their respective trademark owners.



No. GS-35F-5086H