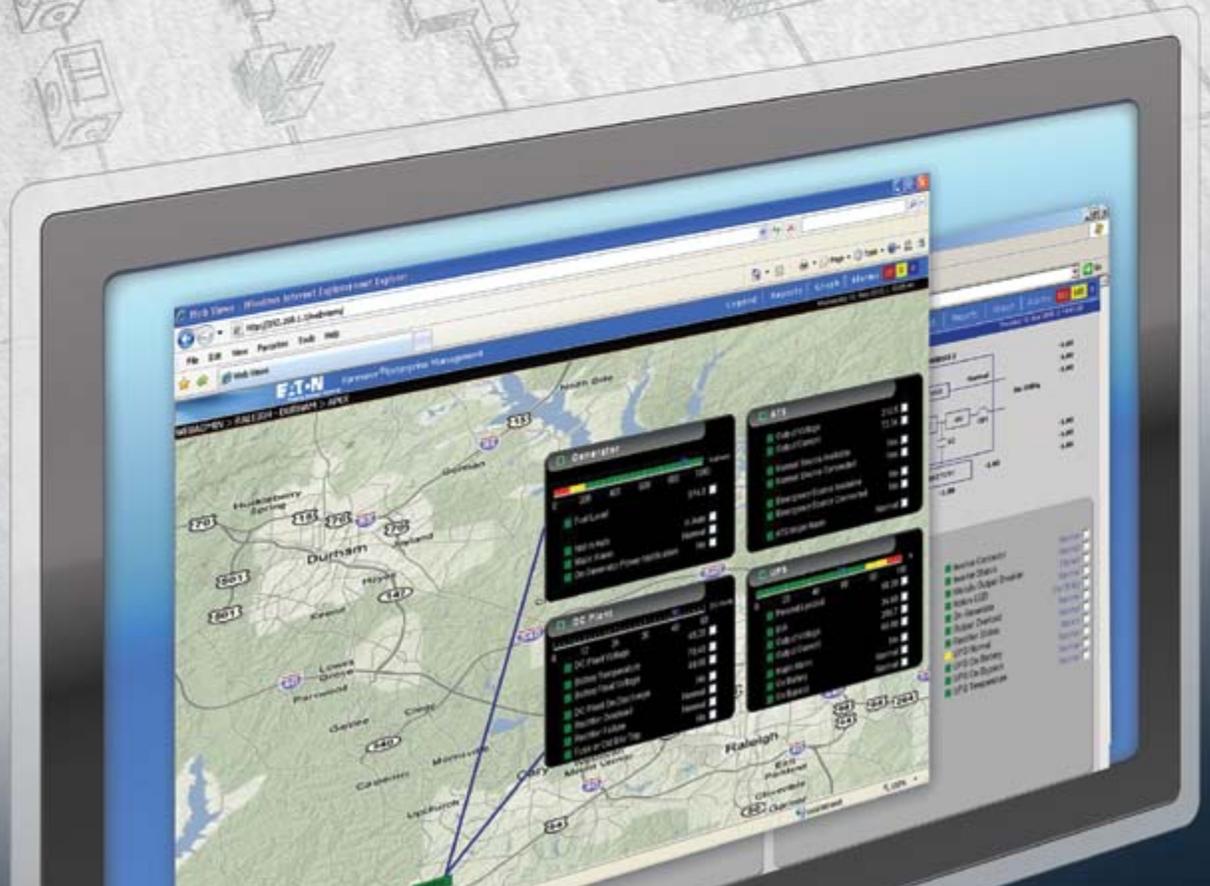


Simplifying the process of
infrastructure and energy management

Foreseer[®] Services

Turnkey Software Integration
& Engineering Services



Powering Business Worldwide

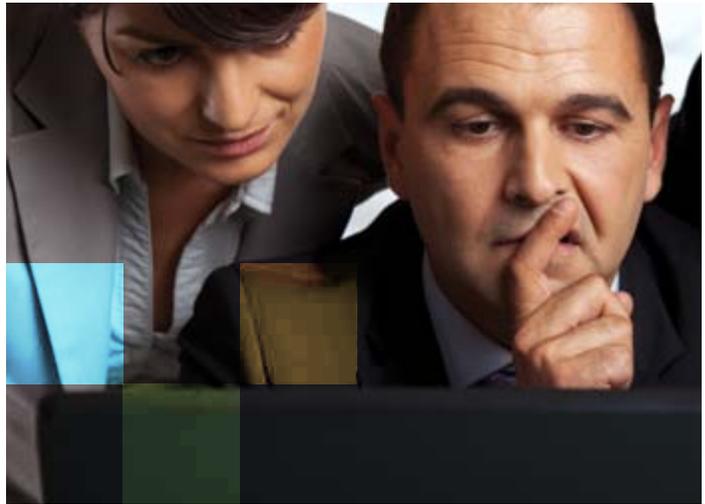
Foreseer® Services

Manage your power and energy infrastructure with real-world facts gained through enterprise-wide integration.

How valuable would it be to detect the threats that could cripple your operation? To receive automatic notifications when issues arise, giving you the opportunity to fix them before they become problems? And, to do all of this regardless of the brand of your equipment and systems? Eaton's Foreseer Services covers it all, enterprise wide. It provides vendor-independent power and energy infrastructure integration solutions that help companies reduce energy consumption and unplanned downtime due to the failure of mission-critical systems.

Professional, turnkey integration to a single system.

You need a single monitoring and management solution that ties all of your complex systems and devices together and can build intelligence in or around them. You need a provider with the experience to deliver a turnkey, integrated solution from project initiation through hand-off, and beyond. You need a solution with a Web-based interface that gives you the big picture with custom mimic graphics and standard reports, from any desktop, anywhere. Foreseer Services from Eaton® is that solution. We connect your operation's vast array of systems and devices into one comprehensive solution.



Foreseer Software Services.

Foreseer Project Management Services.

Foreseer Engineering Services.

Bring Together The Old And The New.

The latest technology helps run our facilities better. It's no surprise that what was selected years ago may not communicate with what you have today. Time and budgets simply don't allow complete system reworks year after year. That's why our Foreseer Services team was organized. Now, you have a resource to integrate systems, both old and new. With Eaton at your side, you can see deeper into your infrastructure and understand it better than ever.

Extensive Experience Integrating Environments Like Yours.

Eaton has developed extensive expertise integrating various infrastructures and environments. We have worked together with major hardware manufacturers and developed a software driver database of over 1,600 device variants. Project management teams, software developers and engineering teams tackle projects ranging from data centers and medical facilities to multi-site military and educational campuses.

Providing A Solution, Not Just A Product.

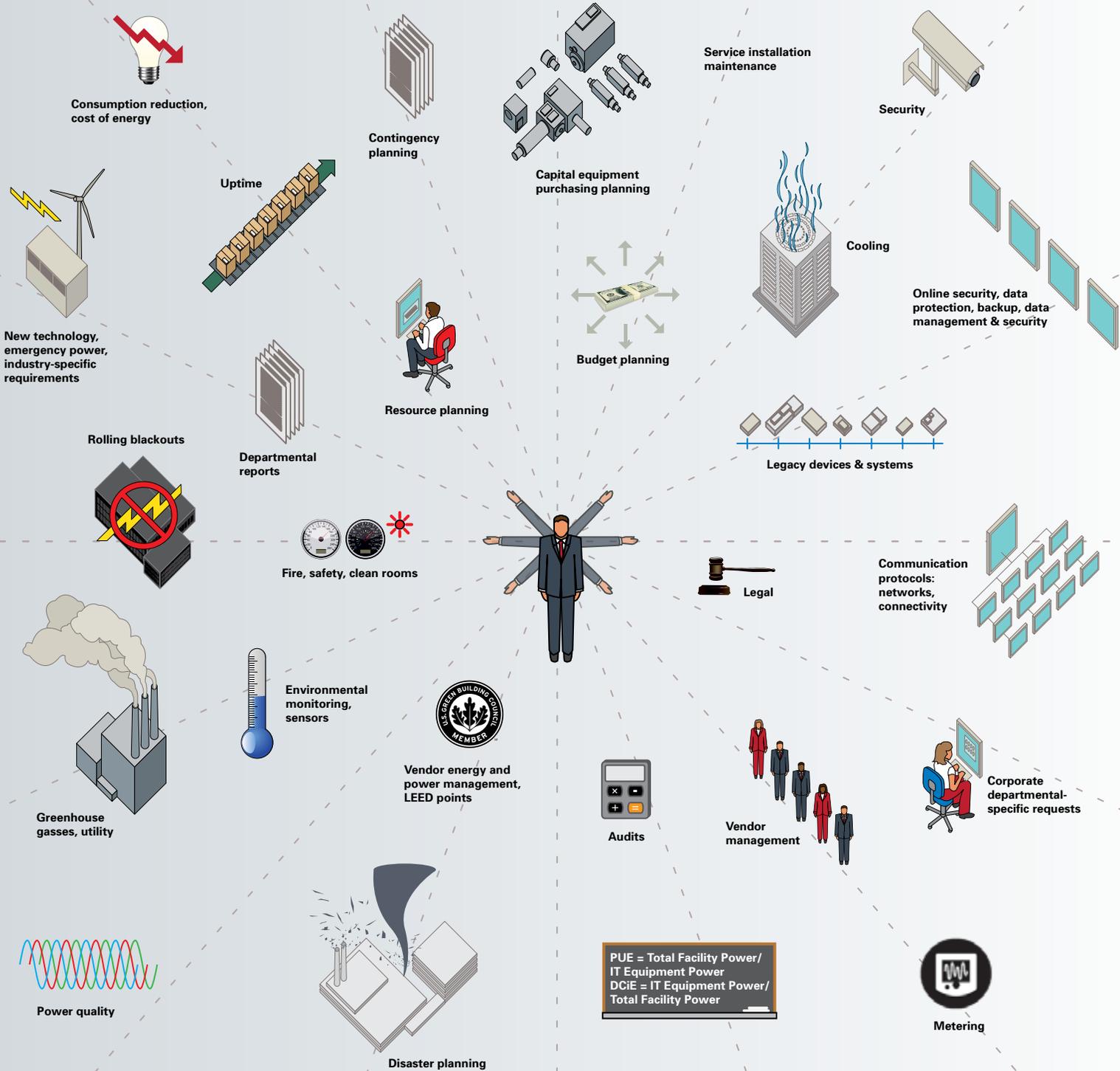
Turnkey software and connectivity solutions coupled with state-of-the-art project management, systems design, third-party device integration, testing and custom application development services will meet your requirements and exceed your expectations.

Successful Power And Energy Management.

Eaton, a Fortune 500 company with over 90 years of experience in a wide range of fields, is a power and energy management leader. From industrial control to

electrical control applications in countless industries, Eaton associates worldwide have demonstrated power and energy management success time and again. From the moment power enters the facility to power quality monitoring and communication with every device using that power, Eaton is uniquely qualified to bring diverse systems together.

Whether your operation is in a single building or buildings around the world, Foreseer Services can help bring all your devices together.



There you are, at the center of it all.

And all eyes are on you. The expectation is that your facility is working right, and running smoothly. But you know that its ability to function properly is dependent on underlying power distribution systems, IT and environmental equipment, safety and security systems, and building controls. Monitoring and managing these systems is critical

to successful and uninterrupted operations. However, most of these systems were acquired from different vendors and often communicate using proprietary protocols. They do not talk to each other, and come with unique software. With Foreseer Services, you're not only at the center of it all, but you have foresight into it all.

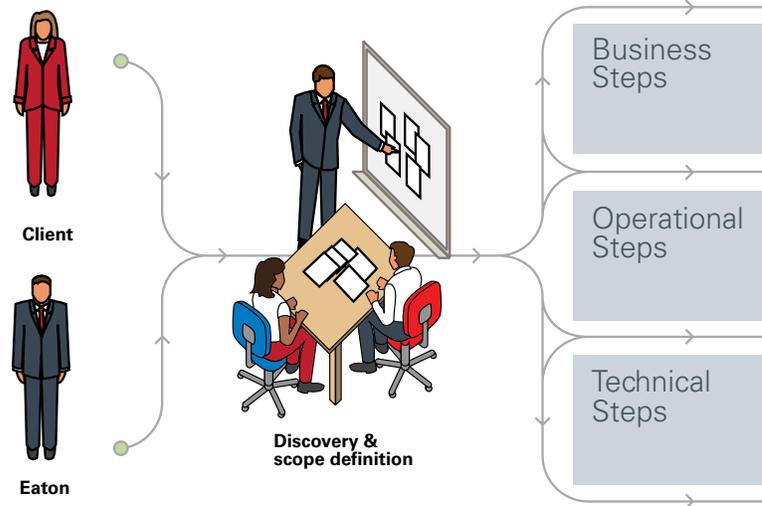
Foreseer Software Services.

Foreseer Software was developed from the ground up to support thousands of devices, connections, device parameters and data logging. It is fully scalable to support a single data center, or multiple facilities no matter where they are in the world. It facilitates monitoring of infrastructure pieces, including HVAC, UPS, power distribution systems (meters, motor control, variable frequency drives, etc.), generators, fire-detection, security systems, and other communicating sub-systems from hundreds of manufacturers—all on one screen.



Foreseer Project Management Services.

Each Foreseer integration project may be customized with a full range of services to fulfill even the most demanding requirements. Services may be selected to fit the immediate and long-term needs of the installation.



Foreseer Engineering Services.

Foreseer Engineering Services provide you with the full array of services needed to design, install, and commission your monitoring solution.

Design Services—Customizing Your Solution.

After extensive assessment of your requirements, and the existing device and facility infrastructure, the Foreseer design services team configures your system, complete with a bill of materials and recommendations unique to your needs. Specification development, drawings and detailed documentation for your project is part of this first critical step.

Third-party device support and communication interface planning is critical, including driver development and enhancement, if necessary. User interfaces are designed with default views to meet your specifications.

Unique solutions set Foreseer Software Services apart.

Four scalable solutions

Foreseer Software Services is available in four classes, capable of handling 15,000 to 256,000 data streams (channels), so you can be assured of the best fit for various integration environments, and the right solution at the right price.

Redundant, Worldwide Coverage

With the Manager of Managers (MOM) software option, data from one server can be monitored alongside data from other servers, enabling you to aggregate multiple Foreseer sites into a single system.

What's more, redundant servers can provide a fail-safe system if communications are lost with one of the systems.

Data Gathering, 24/7

Foreseer Software Services' proactive algorithm gathers data 24/7, enabling you to sample an unprecedented number of data points from thousands of devices—every second.

User Defined Formulas

Information from multiple sources and systems can be inserted into sophisticated user defined formulas, turning complex data into valuable knowledge for informed decision making.

Extensive Device Driver Library

With a library of software drivers for most all communication interfaces and protocols, Foreseer Software Services enables the full-scale integration of third-party products throughout your organization, regardless of size.

Trend Analysis

High performance analysis and forecasting tools assess equipment performance specifications. Cause analysis, impact analysis, capacity planning, preventive maintenance assessments and trending can now be achieved with ease.

Custom User Interfaces

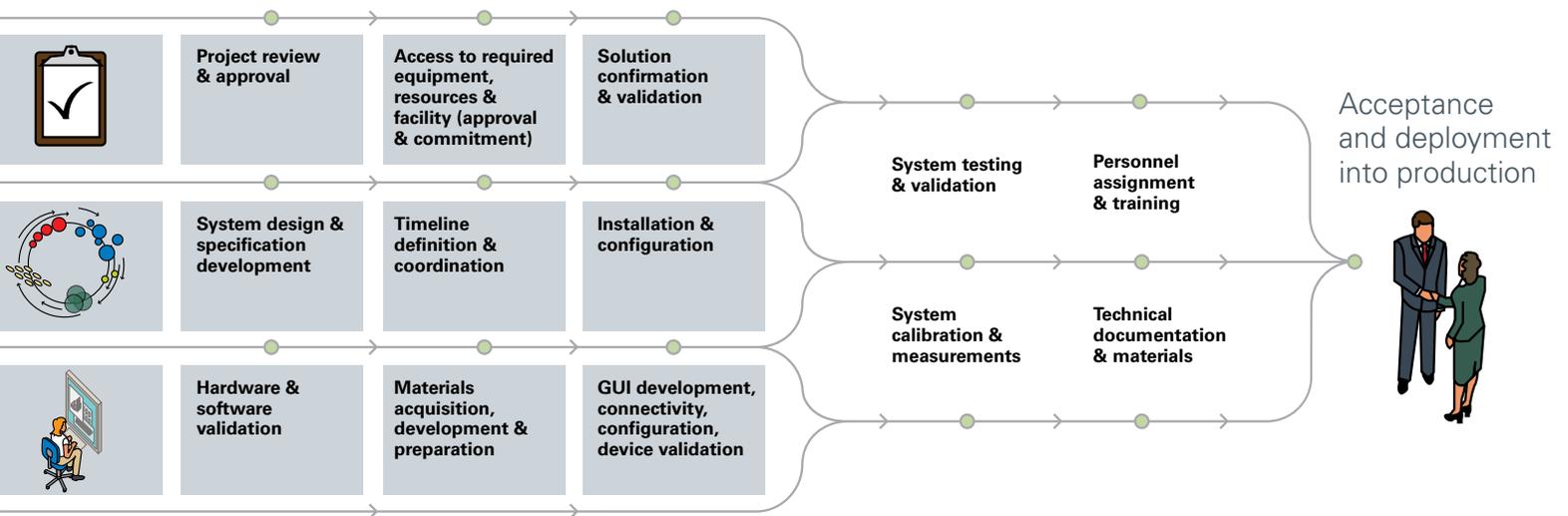
Foreseer Software Services gives you the big picture with custom, mimic graphics, dashboards, and 3D renderings.

Web browser access—Unlimited seats

Web browser access enables easy system access. Multiple users can access Foreseer Software without the need for additional client seat licenses.

Alarm Notifications

For each channel being monitored, you can assign up to four alarm thresholds—from routine maintenance alerts to system failure—plus handling instructions and escalation procedures for each.



Installation Services—Building Every Part of Your System.

Installation services team members are with you every step of the way, from project initiation to handing over the Foreseer system when work is complete. In between, we focus on a range of tasks:

- Start-up needs, testing, and customization
- Drawings and custom graphic layout development

- Customized device gauge graphics and status indicators
- Third-party software integration
- Custom software and application development
- Set-up and configuration of reporting packages and basic Foreseer training.

Commissioning Services—Ensuring System Reliability.

Commissioning services consist of overall and tiered systems testing and full point-to-point system commissioning options. This flexible service provides the level of service you need backed by thousands of successful startups.

Follow-up Services—Putting You in Control.

Our follow-up services team handles all issues related to connectivity, device installation, configuration and customization, hardware integration, third-party system setup, configuration and testing. Technical support and customized service contracts with scheduled site visits are also available with advanced Foreseer system training.

Imagine what Foreseer Services could help you do.

Custom applications solve your unique needs.

When you start thinking about what Foreseer Services can do, it's nice to know we've been doing it for more than 20 years. With the right information in hand, you can make the best decisions to reduce energy consumption and unplanned downtime throughout your mission-critical systems.



Data Center Efficiency

Calculates DCiE and PUE

As IT managers are more focused on the energy efficiency of their data centers, Foreseer Software Services Power Xpert® Reporting option automatically calculates Data Center Infrastructure Efficiency (DCiE) and Power Usage Effectiveness (PUE). These industry-standard efficiency metrics help IT managers understand and track how efficiently their data center is running and how effective improvement efforts have been.

Energy Cost Allocation

Fair Share Utility Cost Distribution

The cost of energy has always been of significant concern when managing departmental budgets. Foreseer Software provides you with energy usage by individual circuit so each device can be a part of the energy management strategy. It even allocates electrical cost to individual and branch circuits, which can then be assigned to individual users of a department or device.

Power Density

Pinpoint Hot Spots in Your Data Center

As racks proliferate and expand from TCP/IP networks, servers and other elements of the infrastructure are placed into smaller areas, making power density a critical measurement. Foreseer Software manages power density by device, for a single rack, floor or an entire building, allowing you to identify overloaded racks and incorrect power drains due to device failure.

Growth Planning

Plan with the Electrical Capacity Planning Tool

Planning electrical usage and demand is a difficult job. As site loads increase and usage patterns change, demand on a device may grow beyond its intended capacity. And, while average demand may not be a concern, peak demand always is. Even a momentary spike has the potential to bring down an entire network. Foreseer Software tracks the kW and kVA over time, immediately informs of peak levels, and projects future demands based on past usage. This knowledge is critical in planning for electrical upgrades and/or changes to the power chain to support changing load patterns.





Load Balancing

Prevent Unbalanced Loads

A major contributor to harmonic distortion is improper load balancing. Foreseer Software tracks load levels by phase, giving instant notification when extreme imbalances begin to occur, and providing the knowledge to take the necessary steps to re-distribute the load before a catastrophic problem occurs. Foreseer Software visually illustrates the load balance of a device or system in real-time, while showing what the balanced model should be. You see the current state, the worst-case scenario and the proper load.

A/C Control Client Software

Take Control of Your Environment

The Foreseer Software A/C interface offers comprehensive monitoring and optional lead/lag control for Air Flow, Data Aire and Liebert System 3 air conditioning units. Lead/lag control and scheduling is viewable via a Web-browser and is controllable with the proper user authority.

Maintenance Scheduler

Eliminate The Hassles

The Foreseer Software maintenance scheduler offers the ability to preset scheduled (weekly or periodic) maintenance windows within the system to disarm selected devices on which maintenance will be performed. Disarming the devices allows continued monitoring and archiving during the maintenance period while disabling alarms and preventing unnecessary notification of personnel.

Foreseer Sightline

Predict Developing Situations

Safety, environmental and electrical problems can be hazardous and costly; often resulting in unplanned downtime. Worse yet, these events seem to arise without warning. With Foreseer Sightline you can project events, energy usage, environmental and safety, among others trends based on current patterns 180 days into the future. With trending data in hand, you're able to define thresholds that will alert you to developing issues well before an actual alarm condition is reached.

Case Study: US Based Manufacturing Company

Problem

A system was needed to manage and monitor power usage and produce data for management decisions and cost projections. The system would need to identify exact power usage by each plant operation, and help managers determine if new equipment would provide energy savings. It also needed to provide trend data and document power anomalies.

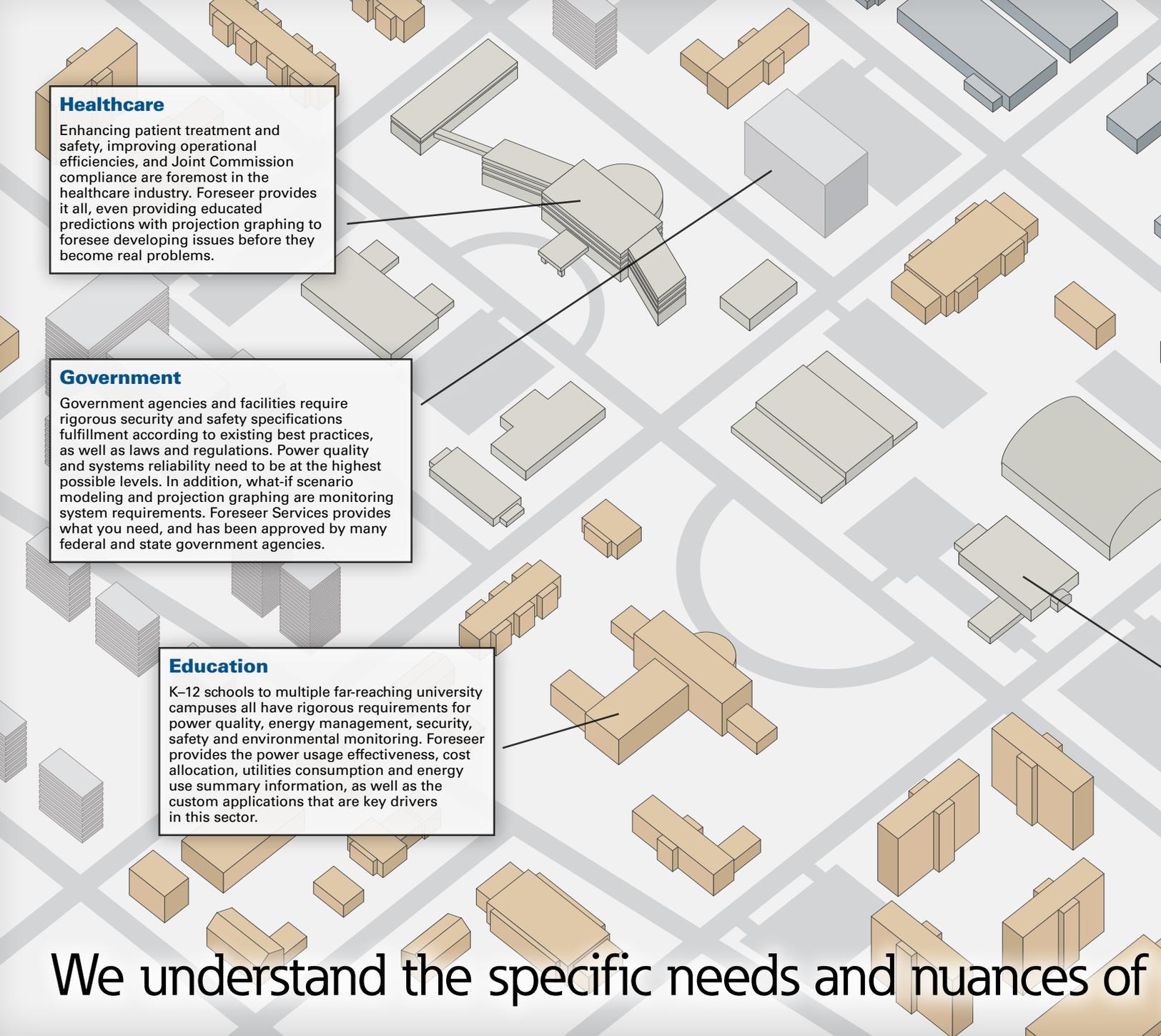
Solution

Foreseer Services was selected to achieve the power monitoring and cost-reduction objectives. Since Foreseer Software can operate on a separate server, concerns about impacting the customer's network were eliminated.

Results

Information is used to make critical infrastructure decisions, such as determining that a new air filtration system would provide energy savings of 40 kilowatts per hour. The system documents power bumps, blips, sags and swells, and shares the information with the utility. With accurate anomaly data, the utility is far more cognizant of the quality of the power it delivers.

"Foreseer Services has given us the ability to make the decisions and take the steps required to reduce our power usage and achieve cost savings."



Healthcare

Enhancing patient treatment and safety, improving operational efficiencies, and Joint Commission compliance are foremost in the healthcare industry. Foreseer provides it all, even providing educated predictions with projection graphing to foresee developing issues before they become real problems.

Government

Government agencies and facilities require rigorous security and safety specifications fulfillment according to existing best practices, as well as laws and regulations. Power quality and systems reliability need to be at the highest possible levels. In addition, what-if scenario modeling and projection graphing are monitoring system requirements. Foreseer Services provides what you need, and has been approved by many federal and state government agencies.

Education

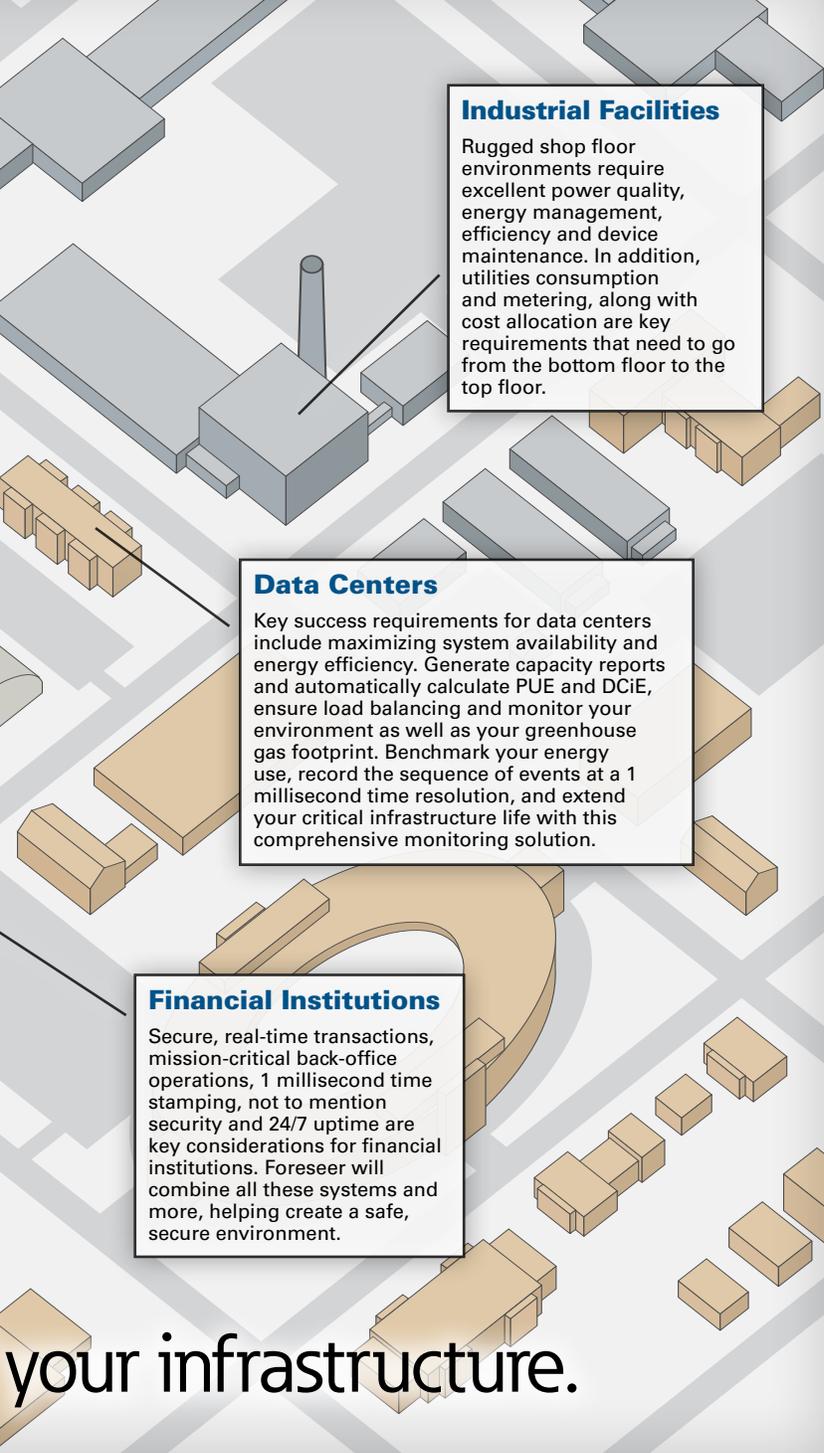
K-12 schools to multiple far-reaching university campuses all have rigorous requirements for power quality, energy management, security, safety and environmental monitoring. Foreseer provides the power usage effectiveness, cost allocation, utilities consumption and energy use summary information, as well as the custom applications that are key drivers in this sector.

We understand the specific needs and nuances of

Different kinds of environments typically require very specific types of solutions. Over the last 20 years we have come across virtually all types of facilities and systems, and understand the applications necessary for each of them. Business sectors, such as financial institutions, health care, education, telecom, industrial and government for example, must all be addressed appropriately according to industry guidelines, best practices, as well as local laws and regulations. The ability to cater to these needs with years of experience, along with hardware and software proven in the field, sets Foreseer Services apart from all others.

Foreseer solutions are at work in hundreds of facilities like yours—right now.

- Data center and co-location facilities
- Industrial facilities
- Healthcare facilities
- Telecom/CATV
- Financial institutions
- Educational facilities
- Government facilities
- Transportation
- Alternative Energy



Industrial Facilities

Rugged shop floor environments require excellent power quality, energy management, efficiency and device maintenance. In addition, utilities consumption and metering, along with cost allocation are key requirements that need to go from the bottom floor to the top floor.

Data Centers

Key success requirements for data centers include maximizing system availability and energy efficiency. Generate capacity reports and automatically calculate PUE and DCiE, ensure load balancing and monitor your environment as well as your greenhouse gas footprint. Benchmark your energy use, record the sequence of events at a 1 millisecond time resolution, and extend your critical infrastructure life with this comprehensive monitoring solution.

Financial Institutions

Secure, real-time transactions, mission-critical back-office operations, 1 millisecond time stamping, not to mention security and 24/7 uptime are key considerations for financial institutions. Foreseer will combine all these systems and more, helping create a safe, secure environment.

your infrastructure.

Vendor-independent device support

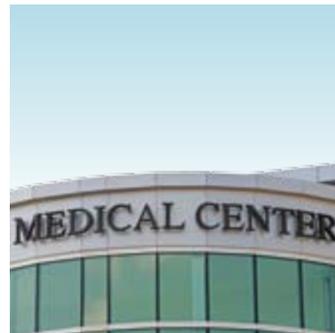
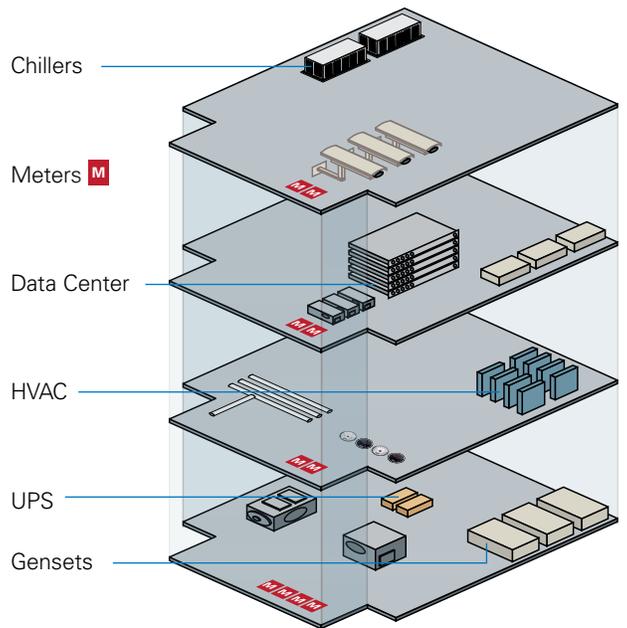
Foreseer Software is vendor-neutral and supports most third-party devices using their native communication protocol, a standard protocol or a protocol gateway. Over the past 20 years of system integration, Foreseer Services has worked with most major hardware manufacturers, to build a device driver database that supports over 1,600 device variants, with new drivers and versions added frequently.

Device Category Support:

- BMS
- Chillers
- Circuit Protection
- Drives
- Environmental Monitoring
- Fuel Monitoring
- Generators
- HVAC
- Leak Detection
- Meters
- PLCs
- Power Distribution Equipment
- Protocols
- Security and Safety
- Transfer Switches
- UPS, and more

Brand Support:

- ABB
- Allen-Bradley
- APC
- Caterpillar
- Eaton
- GE
- IBM
- Kohler
- Liebert
- Lucent
- Mitsubishi
- PML
- Siemens
- Square D
- Toshiba
- Westinghouse, and many more



Configure Foreseer with options that solve your unique needs.

Power Xpert Reporting

Eaton's Power Xpert Reporting works in conjunction with Foreseer Software allowing a view past individual measurements, trend graphs and events. It consolidates complex data from a multitude of devices from around the globe into easy-to-understand graphical reports. It provides a standard set of reports for the most common report requests. Simply choose from ten ready-to-go report templates. Power Xpert Reporting can be set to run the report automatically and send you new, updated reports via e-mail at predefined intervals.

Manager of Managers (MOM)

Provides a powerful means to integrate data from multiple locations where each location is running its own Foreseer Software server. This unique feature provides a scalable system where the total number of integrated points on the centralized MOM server can be as large as 256,000 points.

Sequence of Events Recorder

Enables breaker status monitoring capability at a time stamping resolution of 1 millisecond. During a critical or catastrophic event, sequence of event information is captured by the recorder for retrospective analysis and root cause issue mitigation.

Secure Web Server (https)

Provides an encrypted means to protect all data that is viewed via a standard Web browser on the Internet or intranet. Utilizing the OpenSSL package from the Internet, Foreseer Software is able to provide 128 bit encryption between the Foreseer Software and the Web browser. Both registered certificates from a third-party provider or self-signed certificates are allowed to be used with this option.

Redundancy

Safeguards valuable information. The inclusion of one or more extra Foreseer Software servers provides the highest levels of system reliability. In the event that one Foreseer Software server fails, the remaining servers carry the load of the power monitoring system.

Data Acquisition Engine (DAE)

Designed specifically for geographically or physically removed sites where local IT expertise may not exist. The Data Acquisition Engine automatically collects and sends data from critical infrastructure devices, and communicates that data back to the Foreseer Software server. Using local processing and the shared bandwidth of an IP network, the DAE reduces the cost required to transmit data to the central server. The DAE also continues to operate independently and generate alarms even if the connection to the central server is unavailable, increasing the overall availability of the management system.

Data Acquisition Terminal (DAT)

Easily integrates monitored equipment and sensors located in small, networked remote sites. The DAT employs standard Modbus communications to relay information to either a Foreseer Software server or a Data Acquisition Engine over a TCP/IP network. Data is packaged in sequential Modbus registers to enable optimum scan times without impacting network bandwidth.

Universal Input Enclosure

Provides network connectivity for analog and contact input information along with device server capability.

Each enclosure contains from one to five input modules with pluggable connectors used for power and input wiring, enabling cost-efficient monitoring of equipment in small, remote facilities.

Getting started with Foreseer Services is easy.

To learn how Foreseer Services can enhance the reliability and value of your power distribution, environmental, safety and security systems, or to see a live, online demo, visit our Web site at www.eaton.com/foreseer, call your local Eaton representative or our Foreseer Services hotline at 800.356.3292.

Case Study: Global IP Services and Web-hosting Company

Problem

A leading provider of global IP services must keep network operations up and running regardless of storms, earthquakes, rolling blackouts, and routine wear and tear on systems' equipment. Identifying developing problems before they become critical and reacting quickly are key to staying online.

Solution

Foreseer Services was selected to provide constant, real-time monitoring of all power, environmental, safety and security systems. It monitors hundreds of devices including uninterruptible power supplies and DC power plants, to air conditioning units and temperature/humidity sensors, as well as stand-alone smoke detection and fire suppression systems.

Results

An online database for each monitored point and easy-to-use automated data analysis routines deliver up to three years of historical and trending information (e.g., event magnitude, cause/effect relationships, before/after impact analysis). Proactive management tools help staff members identify dangerous patterns so corrective action can be taken before failures occur.

"Because we know in advance about conditions that might affect our operations, we can control the situation before it gets out of hand. And if a problem does occur, we know immediately what we have to do to correct it. We stay on line and, most importantly, so do our customers."



Service Components

Services

Typical Design Services:

- System design and bill of material development and recommendations
- Specification development, drawings and documentation
- Third-party device, communication interface and driver design and development
- Interactive software user interface design

Typical Installation Services:

- Complete project management services
- Complete turnkey installation options
- System installation and start-up services
- System testing and customization
- 50%, 95%, and 100% custom installation drawing package
- Customized graphic layouts and backgrounds
- Facility and equipment mimic graphics
- Online layouts development
- Customized device gauges and status indicators
- Custom software installation and configuration

- Device configuration, setup and testing
- Custom software and application development
- Third-party software integration
- Reporting setup and configuration
- Basic Foreseer Software training

Typical Commissioning Services:

- Overall system testing
- Tiered systems testing
- Full point-to-point system commissioning options

Typical Follow-up Services:

- Connectivity devices installation, configuration, testing and customization
- Eaton hardware integration
- Third-party hardware integration
- Other device configuration, setup and testing activities
- Advanced Foreseer Software training
- 24/7 technical support
- Customer Care contract with scheduled site visits

Hardware

- Universal Input Enclosure (UIE)
- Sequence of Events Recorder (SER)
- Data Acquisition Engine (DAE)
- Data Acquisition Terminal (DAT)
- Server

Software

- Foreseer Software Classes
 - Foreseer C-Class Server Software (up to 15,000 channels)
 - Foreseer M-Class Server Software (up to 25,000 channels)
 - Foreseer R-Class Server Software (up to 100,000 channels)
 - Foreseer S-Class Server Software (up to 256,000 channels)
- Manager of Managers (MOM)
- Secure Web server
- Redundant Server
- Power Xpert Reporting
- Upgrades
 - Foreseer Class Upgrade
 - Foreseer System Upgrade v. 4.x to v. 5.x
 - Foreseer System Upgrade v. 2.x to v. 5.x

