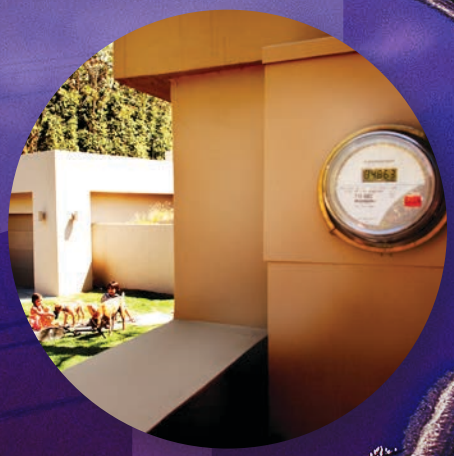
Deliver More Value From Grid Operations



Modernizing the Worldwide Power Grid

Around the world, electric utilities face the challenge of modernizing aging infrastructure, to support more reliable and efficient power delivery.

Operators are looking for ways to optimize the productivity of investment in new and existing facilities, and integrate more distributed energy resources onto the grid. At the same time, they must help ensure grid security and manage operating expenses (OpEx), while complying with continuously evolving regulatory requirements.

An undertaking of this scale requires a communications infrastructure architected to support crucial business priorities and lower the total cost of ownership (TCO).

Addressing Business Priorities

As the worldwide leader in networking, Cisco® provides one of the industry's most comprehensive portfolios of infrastructure solutions to address top utility business priorities.

Maintaining Reliability

To support safe, reliable power delivery, Cisco helps assure continuous high availability of grid operations, with communications solutions that enhance situational awareness across the grid. Cisco self-healing architectures support continuous monitoring of distributed systems and devices, as well as the tools needed for condition-based maintenance.

Addressing Regulatory Requirements

While regulation varies across international borders, governments are focused on increasing the renewable energy portfolio, supporting customer data privacy, and securing critical infrastructure. Cisco allows utilities to efficiently integrate distributed resources onto the power grid. Utilities can meet information privacy concerns by securing data traffic and storage, and supporting security compliance from assessment to design and deployment.

Upgrading Aging Infrastructure

Power companies are balancing the cost and risk of large-scale upgrades with the need to extend the useful life of the installed asset base. Cisco helps utilities manage such risk, by supporting a phased technology migration that interoperates with and protects investment in existing infrastructure, while enabling new applications and services.

Anticipating an Aging Workforce

Nearly one-third of today's utility workforce is predicted to retire in the next five years. New hires need to be rapidly onboarded and trained to prevent this body of knowledge and experience from being lost. Cisco offers technologies that support knowledge transfer and training, connect subject matter experts with distributed teams, and help improve collaboration and productivity.

A Platform Designed for Grid Security

As national critical infrastructure, the power grid needs to be protected from both external threats and internal incidents. Security policies must therefore extend beyond basic compliance to proactive physical and cyber practices and solutions. Cisco has a long history of providing integrated security solutions offering defense in depth for threat detection, containment and mitigation, controlled access to resources, and coordinated incident response.

Cisco Connected Grid Portfolio

Cisco offers an end-to-end portfolio of communication infrastructure solutions and professional services to help power companies and grid operators achieve more value from their operations on a single, intelligent, and highly secure network platform.

GridBlocks™ Architecture

The Cisco GridBlocks architecture provides a framework for integrating the electrical grid with a digital network, to deliver a highly secure, reliable communications infrastructure. This modular approach allows projects to be implemented over time, leveraging existing infrastructure, while building toward a strategic, forward-looking architecture. Each GridBlock module offers specific design guidance for deploying applications and solutions as part of a grid modernization roadmap.

Transmission and Substation Solutions

Cisco delivers Connected Grid solutions, including substation automation and utility-grade WAN. These solutions improve operational efficiency, help enable remote monitoring of substations, and enhance preventive maintenance of deployed assets. Support for critical applications, such as timing distribution and teleprotection, helps reduce costs for the utility. In addition, Cisco substation solutions support protection and control, as well as establish electronic security perimeters with integrated physical and cybersecurity capabilities. Cisco networking capabilities, which are based on ruggedized routers and switches, support industry standards such as IEC 61850 and IEEE 1613.

Grid Security Solutions

Across the grid, Cisco offers integrated solutions to help enable critical infrastructure-grade security that reduce vulnerability to physical and cyber threats for systems, data, and assets. This layered security approach allows the communications network to serve as a security mechanism, controlling access, detecting intrusions, sending alerts, and automatically defending against threats. The network also integrates comprehensive physical security systems, including video surveillance, physical access tools such as card readers, and sensor networks that monitor the status and location of assets.

Workforce Enablement Solutions

Cisco offers solutions and services to enable workforce collaboration for field personnel, integrating disparate communications such as radios, cellphones, and public safety systems. They improve operational efficiency and access to remote experts for troubleshooting and training. Such solutions can also be integrated with utility operational systems, such as Outage Management, for faster response time and better coordination between field crews, dispatchers, and remote expert advisors.

Field Area Network Solutions

Cisco offers the industry's first multi-service communications infrastructure for field area networks (FANs). This supports applications such as advanced metering infrastructure (AMI) and distribution automation, as well as workforce automation over a common network platform. These open-standards solutions support different communications systems including fiber, wireless mesh, cellular, and 4G (WiMAX and LTE) networks. Based on a ruggedized field router, Cisco networks provide a reference design for endpoints (such as meters) and device management for field crews.

Grid Operation Solutions

The Connected Grid Network Management Solution (NMS) offers communications infrastructure administration for utilities, providing end-to-end monitoring and control of communications. This enterprise-class visibility scales to millions of endpoints, to support rapid deployment, centralized monitoring, and troubleshooting of IP-enabled devices. The Cisco Connected Grid Design Suite helps substation engineers and telecom staff to rapidly design, model, and test communications networks across multiple substations. These solutions simplify management, optimize growth, and improve ease of use for grid operators.

Connected Grid Services

Based on extensive industrial experience around the globe, Cisco world-class services teams help utilities develop and align strategic telecom solutions to business imperatives. Our experts offer guidance and consulting for communications infrastructure investments, use case development, network and security assessments, architecture design, migration, testing, and optimization of the communications network. In addition, Cisco provides design and implementation services to support communication infrastructure deployments for substations, field area networks, grid security, WAN architectures, and data centers.

Gary Murphy
Chief Project Officer for SMI Programs
BC Hydro

Real Customers, Real Results

As the worldwide leader in networking, Cisco brings more than 25 years of experience to develop highly secure, reliable, and scalable communications solutions for utilities. Recent projects include:

- A Canadian utility that deployed two million smart meters on a Cisco multi-application field area network. Based on the Connected Grid network management system, the firm anticipates US $70 million in savings over the first three years.
- An Australian grid operator that used Cisco Connected Grid Services to develop a highly modular and flexible architecture, to support phased implementation of IEC 61850 compliant substations serving 1.6 million customers.
- A Chinese power company that addressed the complexity of automating a large-scale digital substation deployment, using the Connected Grid Design Suite to reduce implementation time and costs for thousands of substations.

By delivering multiple applications over a single, intelligent, and highly secure platform, electric utilities benefit from lower TCO as well as creating value from new services and functional integration well into the future.

To learn more about how Cisco is helping utilities across the globe, please visit:

Cisco Utilities and Smart Grid:
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