# TELECOM SOLUTIONS
# TO BOOST POWER UTILITY EFFICIENCY



*Power utilities are continuing to improve their expertise in telecommunications to meet their needs for higher data capacity and better service. Not only are they extending specialized subsystems throughout their networks, they are laying optical fiber along their core business networks of wires and pipes. By combining multiple service networks on a converged optical fiber platform, Alcatel makes it possible for power utilities to improve operational reliability and security while reducing network complexity. At the same time, harnessing transmission and distribution systems to deliver competitive telecommunications opens up a new source of revenue.*

## INTEGRATING NETWORKS TO MAKE THEM MORE SECURE

Utilities are hardly newcomers to telecom services. They often own a broad infrastructure covering a city, state, region or even a country, and have traditionally relied heavily on separate voice and data networks for running their business.

Information and communications technology (ITC) is used for process monitoring, grid management, automatic emergency shutdown, maintenance and security systems, internal communications, data transfer and storage, billing and corporate IT networks. In some cases, each of these functions depends on separate service or local area networks with telecom extensions over leased lines or optical fibers. Working together, they all contribute to maintaining a steady supply of *gas, water or* electricity while assuring that incidents on the core business network do not cascade upwards to create disastrous and expensive nation-wide blackouts.

For an IT manager working in the utility environment using several networks to serve a single goal (i.e. continuity of the supply of power, gas, water) creates a dilemma. On one hand, there is a temptation to keep all service networks separate since there is no reason that e-procurement or customer billing should be running on the same platform as power plant security cameras or power network control systems. On the other hand, a diversity of local or wide area networks comes at a price in terms of design, deployment and maintenance costs. Ideally, one would like to run all services on a single secure

platform that could segregate all mission-critical subsystems whilst providing appropriate levels of security.

This solution has other advantages. It simplifies cross-network connectivity for real-time monitoring and control guaranteeing the traffic segregation between the different sub-networks. It also speeds up decision-making in an industry that increasingly must manage power handoffs between grids in minutes, if not seconds, so as to assure high quality of service and low latency. It creates a more transparent, information-rich network for management. Finally, it provides headroom to integrate future applications, like demand management and automatic corrective action based on network-centric solutions using multiple scenarios.

## Creating UTelco opportunities
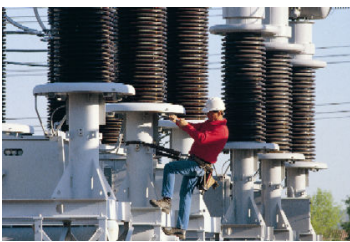


In addition to reducing operational complexity, utilities are looking for ways to maintain and generate new revenue to survive in the more competitive, deregulated environment. That is why many of them are transforming themselves into "UTelcos," i.e. power utilities offering competitive telecommunications services.

This makes sense since they already have accumulated experience in operating a telecommunications network, and have a distribution infrastructure reaching right into the consumer's living room. They also have proven know-how as service providers and an existing support network, including everything from marketing to maintenance.

With over 16 million customers, Spain's Iberdrola is one of the world's leading private electric utilities. Through their telecom operator, Neo-Sky, Iberdrola group now provides broadband and access services to business users on top of their optical transmission network by using Alcatel-designed SDH technology. According to Miguel Angel Sanchez Fornié, head of the Telecommunication Division of Iberdrola, member of UTC board and chairman of the European Utility Telecom Council, *"With over 100 years experience in electricity, we are now a leading UTelco, providing our customers, internal and external, with Gigabit Ethernet over our own transmission network. This dramatic transformation was achieved in just a few years and thanks to Alcatel's solutions we have been able to enhance our business operations and the reliability of mission-critical service delivery.*
*With the UTC, we helped to develop the UTelco business model. Today, this organization is helping other utilities to maintain the high quality of their private networks, while facing new regulatory, technological and business challenges. At the same time, we are encouraging them to use their telecom experience to develop and deliver new, competitive commercial communication services to better serve their communities."*

Fiber is relatively low cost and easy to install via self supporting optical cables between existing poles or optical ground wire (OPGW). Once fiber is available, the utility can choose from a number of options. It could provide voice and data services to its own customers; lease unused "dark" fiber or fiber ducts to

other service providers; or become a full-fledged telecom in its own right. If municipally-owned, it could even make a significant contribution to the quality-of-life and job creation within the community.

Once again, platform integration provides an important boost in terms of flexibility and the ability to offer innovative services to customers. It also allows a UTelco to take a step-by-step approach aimed at specific customers, gradually phasing in new deployments as revenues rise: in other words, a "pay as you earn" approach whereby capital expenditure is covered by increased cash flow.

## HOW ALCATEL BRINGS IT ALL TOGETHER

According to Romano Valussi, head of Alcatel's Optical Networks activities, the key to serving the utilities market is not by imposing an optical solution on the existing network, but by seeing how a customer's network is evolving.

*"Many of our existing customers are faced with a critical choice: either they extend IT systems upwards to handle telecommunications, or extend telecommunications downwards to handle IT. That's why our solution is based on consultation first so as to see how the installed base can be best optimized. Then we move to network transformation to help customers incorporate next generation architectures or deploy new services. More than a vendor of optical equipment; we act as an end-to-end advisor, ensuring efficient energy production and distribution while opening up new opportunities for power utilities as telecom service providers."*

The heart of Alcatel's solution for utilities is a highly reliable, single optical platform that supports the convergence of different transmission media. Unlike "silo-based" architectures, Alcatel's network management suite uses a modular approach with specific products for every layer of the network, including the **transport layer** (WDM and SONET/SDH) to assure reliable and continuous data transmission over optical fiber or microwave links; the **aggregation layer** (TDM, ATM, Ethernet, IP, IP/MPLS and VPLS, RPR) to gather and manage traffic; and the **access layer** (TDM, FTTx, xDSL, WiMAX, etc.) to provide port density and delivery to end-users. What this means is that this infrastructure can be tailored to handle the unique requirements of the power utility, for example an advanced supervisory control and data acquisition (SCADA) system or corporate LAN, while continuing to support the evolution and consolidation of new functions, like advanced metering services. Once this highly flexible infrastructure is in place, the power utility can even offer a full range of competitive telecommunications services (voice, data and video communications) to its customers with no impact on the internal communication systems.

## THE BENEFITS OF CONVERGENT TELECOM SOLUTIONS

A vivid example of how Alcatel contributed to power utilities' efficiency arose when Alcatel deployed a multi-service transport network for a consortium of Swiss electric power providers: Atel, BKW, and EOS.

According to consortium spokesman, Rolf Wirz: *"Alcatel's Optical Multi-Service Network allows us to exchange voice, data and video communications over a common infrastructure. This not only reduces service provisioning time, the increased bandwidth enables us to maximize the efficiency and reliability*

*of our business operations and lower operating expenses."* Alcatel is also supplying its 1350 management suite, providing virtual private network (VPN) capabilities, as well as a full range of support services, from deployment to maintenance.

There are other benefits:

✓ First, utilities can simplify operations to focus on core activities. By taking end-to-end responsibility, Alcatel frees them to do what they do best.

✓ Secondly, Alcatel keeps vital data flowing for operational continuity and security.

✓ Thirdly, the power utility's telecommunications are future-proofed, with the possibility of easy upgrades using fully compatible optical products.

✓ Finally, there is a real opportunity for generating extra revenues from existing infrastructure, by leasing long-distance fiber backbones or last-kilometer fiber-to-the-home (FTTX).

## A PARTNER FOR TRANSFORMING NETWORKS

Aside from providing the various nodes, adapters, and systems to connect the various embedded subsystems of an energy network, Alcatel offers all of the switches and routers needed to support multi-service capabilities, including end-user access points over copper, optical or wireless media.

This is illustrated by the solution selected by NEK EAD (Natsionalna Elektricheska Kompania), the Bulgarian national electrical company, to deploy a turnkey, high-speed multiservice network connecting more than 60 sites across the country.  Offering the highest levels of reliability, security and efficiency, Alcatel's end-to-end solution will provide NEK with the remote control of its processes from energy production through to distribution, improved service delivery, as well as the flexibility to introduce new services based on its business requirements.
Scheduled for completion in March 2007, the project, for which Alcatel has overall management responsibility, will be rolled out in three phases. Alcatel's customer-tailored solution is based on its industry-leading optical, IP and narrowband access technologies. With this deployment, NEK will enhance multimedia communications between its sites by leveraging the mission critical supervisory control and data acquisition (SCADA) application, as well as Ethernet-based applications, Local Area Networks/Wide Area Networks and PABXs.

Another focus is on Storage Area Networking (SAN). Since the integrity, accessibility and recoverability of data anytime and anywhere has become a top priority for power utilities, Alcatel has developed SAN solutions based on WDM platforms and next-generation SDH equipment. This makes it possible to transparently share information among multiple sites rather than to concentrate storage on a single, vulnerable data center.

Figure 1 - Transparent Data Transport with the Alcatel SAN Extension Solution
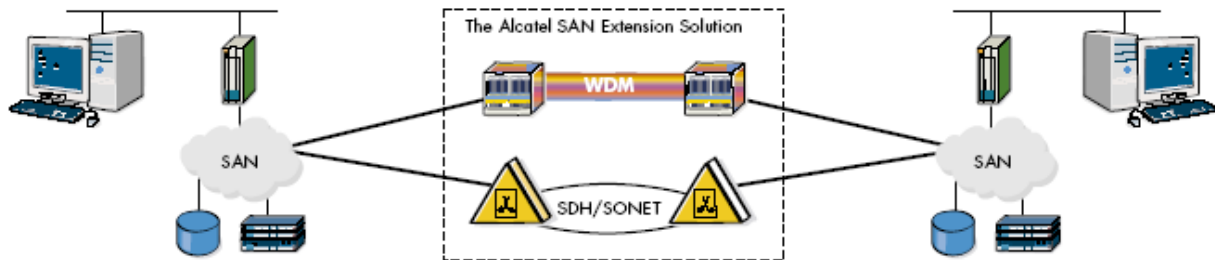
## A Range of Professional Support Services

Alcatel also offers a full portfolio of professional services, including consulting and design, deployment and integration, and operation and maintenance. With global expertise and field-proven solutions, Alcatel is a solid partner for power utilities who want to strategically transform their networks, and not just upgrade at random.

In the wake of the massive blackouts of a few years ago – which served as a wake-up call, especially for grid management – convergent optical solutions allow power utilities to attain new levels of safety and security by speeding up reaction time, and improving communications at all levels. At the same time, they open up new windows of opportunity for providing multiple data services to end-users.

**China's largest power supplier opts for optical multi-service**
China's State Grid Corporation (SGC) is deploying an Alcatel optical multi-service backbone network to reinforce nationwide power distribution. The 1,692-kilometre long project will significantly enhance voice, data and multimedia services in STD's offices to support new communication services in western China. Alcatel has already installed advanced networking solutions in over 20 provinces throughout the country.