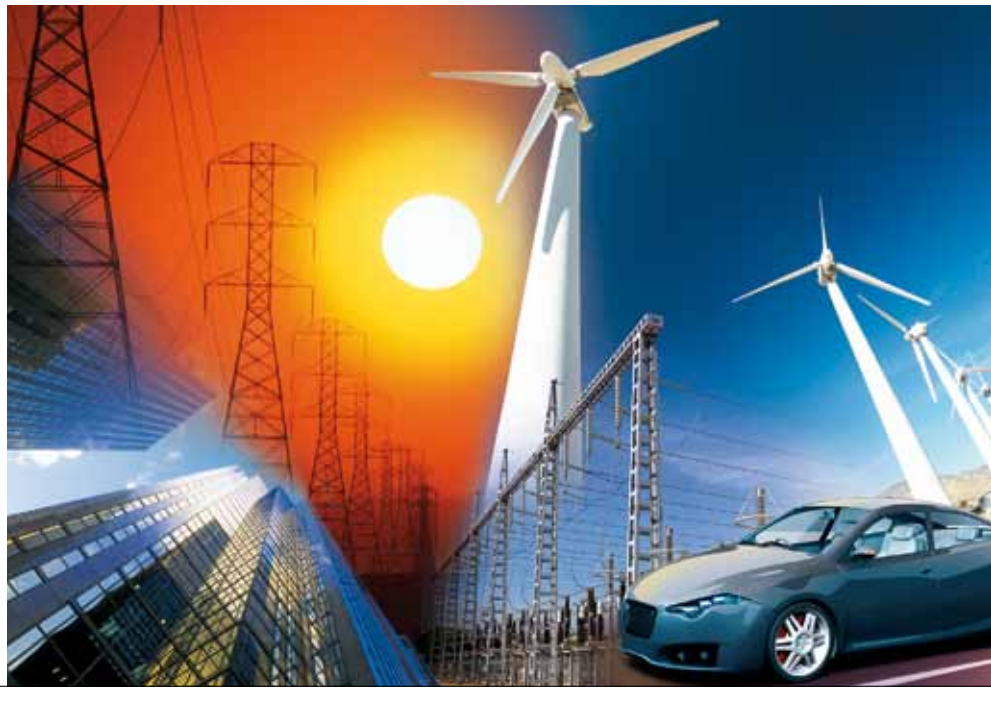
Nexans



Solutions and services to help you deploy a smarter grid

The drivers of the energy business...

While 1.5 billion people – one-fifth of the world's population – are still without electricity, power generation capacity has been increasing by 3% annually to provide human comforts and create conditions for economic growth. This has been putting undue strain on existing infrastructures, which in many cases date from the 50s and 60s. As a power utility or power provider you want to make your network smarter to meet the challenges of:

- **Efficiency:** You want to transport the most energy possible, with minimal loss or bottlenecks. You need to discover hidden congestion problems due to cable type and capacity, or network architecture, and assess potential risks, like changing climatic conditions. You want to know how much energy your customers use and when, according to region. You want renewable energy resources feeding into your network at every level with improved load management, possibly via dynamic control.

- **Reliability and Security:** You must be certain that electricity is delivered reliably, meaning no cuts, breakdowns, cascading failures or blackouts, and without frequency variations or quality fluctuations (spikes and dips). You want to reduce equipment failure and decrease the quantity and duration of faults and outages so you can protect distant or thinly populated areas. Security means quickly spotting overheating to prevent lines from sagging onto trees, or freezing rain which can lead to ice accretion and power failure. You may need to discourage energy theft, or you want to fully control substation operations and assure the integrity of your client lists. Wherever possible, you would like to see abnormal situations (e.g. overheating, short circuits) detected and remedied automatically.

- **Flexibility:** Where congestion creates delivery problems, you want to reroute, share or import power so as to manage the ups and downs of the business. This requires continuous monitoring, network supervision, and smarter transmission tools to assess a situation and take immediate action, like turning on gas micro-turbines or drawing on wind power. You need to access vital user data through Advanced Metering Infrastructure (AMI) and exchange information through high speed optical fiber.

- **Eco-friendliness:** Because your customers are environmentally-sensitive, you need to reassure them that buried and overhead lines are safe, and generate minimum losses and CO_2, with low Electro-magnetic Interference (EMI). Your network should allow interaction with multiple types of electric vehicle and clean generation & consumption at customer level. When networks are upgraded, obsolescent cables must be removed with no damage to urban areas or natural habitats, and materials recycled safely and efficiently.

...demand Nexans' global expertise

We understand your challenges

To improve efficiency, we strive to understand your overall network through load contouring to see what solutions are most appropriate. For example, we have high-tech cables which can incorporate measurement of temperature. More than just a cable manufacturer, we are developing solutions which will allow utilities to offer new services to their own customers, like high-speed Internet.

We provide life-cycle upgrades

To ensure reliability and security, we offer services to improve your network, like ongoing maintenance and replacement of fluid-filled cables. We study customer needs in actual conditions. Simulation allows us to see how temperature can be monitored in real time to better manage the grid or overloaded sections. Sophisticated software makes it possible to simulate the entire environment so as to suggest appropriate monitoring systems or advanced conductors that provide low sag, high-temperature or anti-robbery solutions.

We offer customized solutions

To provide flexibility, our joints and accessories are customized according to cable type and use, which can merge existing technologies (like fluid-filled and XLPE) so that you don't have to change everything at once. Thanks to their almost instantaneous response to fault currents, our Superconducting Fault Current Limiters prevent switchgears and other power network components from being damaged during short-circuit events. They enable in particular the connection of power grids and renewable energy sources with no modification of the protection scheme against fault currents.

We develop new technologies

To promote eco-friendliness Nexans has developed solutions for sustainable energy, from windfarms and photovoltaics to safe nuclear energy.
We pioneered protected seabed installations and these cable designs eliminate hazardous materials (lead) and take into account CO_2 impact.
We can help you find the most feasible solution for improving security while decreasing kilowatt losses. When your networks need upgrading or replacement we offer a full recycling program to protect the environment and reuse materials.

Nexans helps you to evolve...

Whether you have a basic network with essential internal communications, or an expanded network Nexans can help you evolve upward through five technological stages.

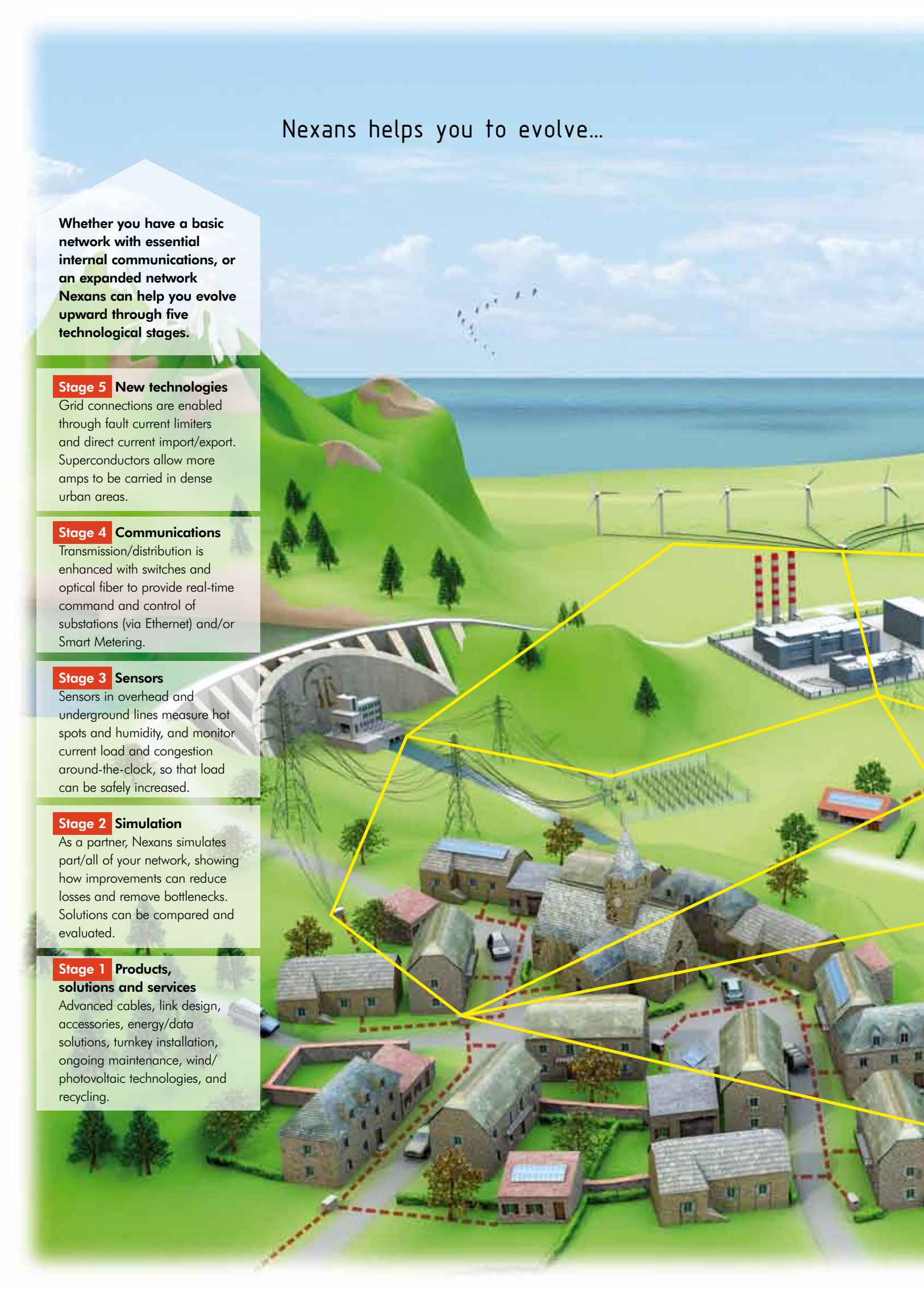
Stage 5 New technologies
Grid connections are enabled through fault current limiters and direct current import/export. Superconductors allow more amps to be carried in dense urban areas.

Stage 4 Communications
Transmission/distribution is enhanced with switches and optical fiber to provide real-time command and control of substations (via Ethernet) and/or Smart Metering.

Stage 3 Sensors
Sensors in overhead and underground lines measure hot spots and humidity, and monitor current load and congestion around-the-clock, so that load can be safely increased.

Stage 2 Simulation
As a partner, Nexans simulates part/all of your network, showing how improvements can reduce losses and remove bottlenecks. Solutions can be compared and evaluated.

Stage 1 Products, solutions and services
Advanced cables, link design, accessories, energy/data solutions, turnkey installation, ongoing maintenance, wind/photovoltaic technologies, and recycling.



...towards a smarter, interactive, integrated network

EFFICIENCY

To transmit energy in the most efficient way possible over your network requires simulation of actual performance to see where losses and saturation are occurring. Corrective action could include more efficient conductors, real-time monitoring and superconductors. Energy loss can be vastly reduced by new cable designs and high-voltage DC underground and submarine cables.

• When your network is over-congested, Nexans can replace saturated cables with cables that carry more energy. For example, replacing some ACSR conductors with AAAC-Z conductors reduces overload and can decrease losses by more than 20%.

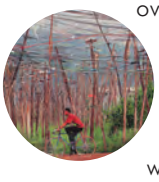
In certain conditions, replacing saturated ACSR OHL with superconductors underground cables which can carry more energy would even cut global losses by more than 40%.

• Nexans provides tension-based Dynamic Line Rating for overhead transmission lines. This technology allows the utilities to know the true transmission capacity in real time, it increases transmission capacity significantly for over 90% of the time, and protects the transmission lines from overheating and sagging beyond safety limits.

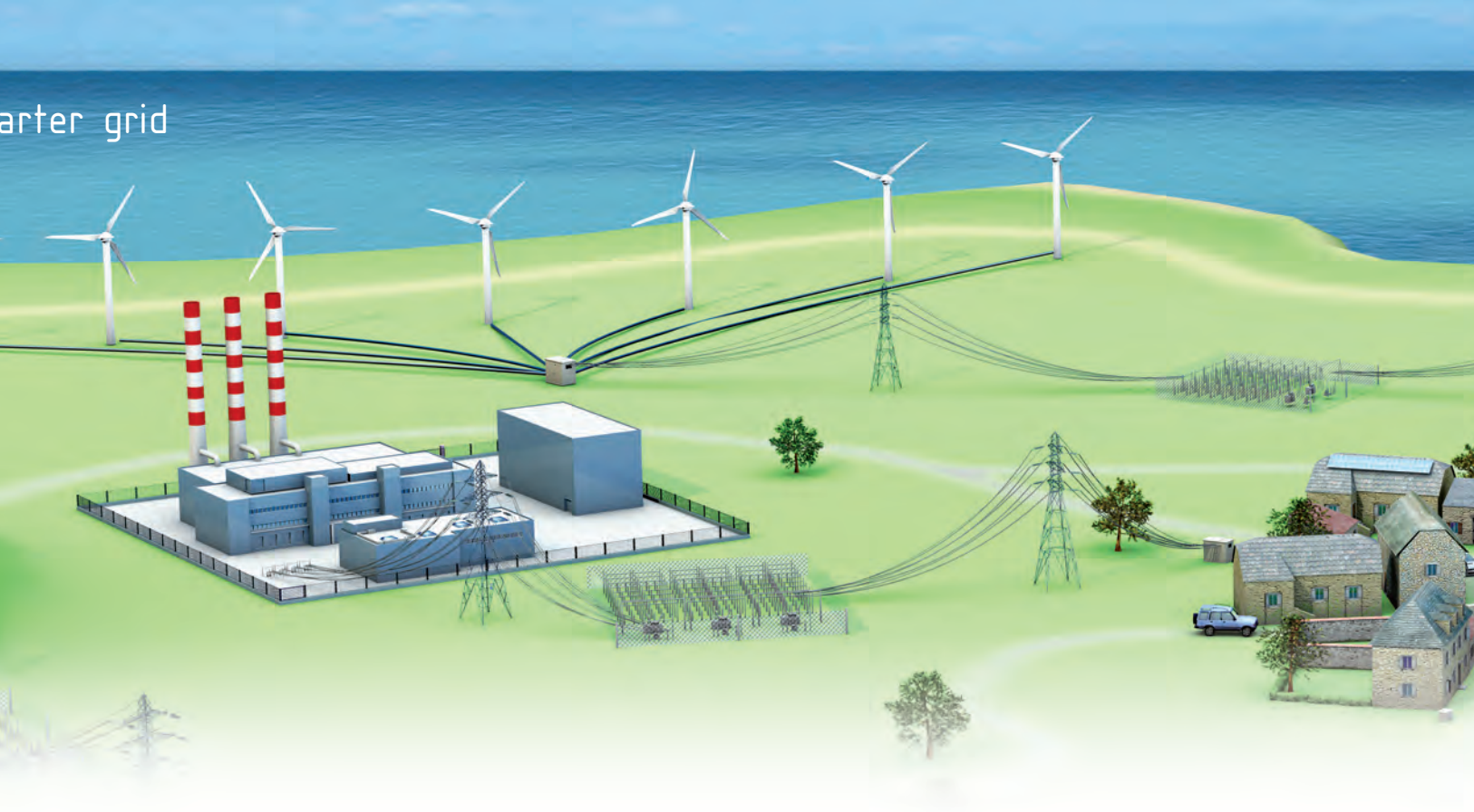
Nexans has installed the system for over 100 utility customers, including Manitoba Hydro (Canada), Kansas City Power and Light (US), RTE (France) and REE (Spain). Currently Nexans is supporting installations in Texas for ONCOR within the framework of the American Recovery and Reinvestment Act of 2009.

• For the Long Island Power Authority (LIPA) in NY, Nexans installed the world's first high-voltage superconducting cable making it possible to transfer much higher power than a standard underground cable. Not only does the system allow bi-directional power links, it has no thermal or electromagnetic impact on the environment.

• To counter significant, non-operational energy losses by utilities (sometimes up to 25-30%) and dangerous overloading, Nexans developed a concentric LV copper cable which causes a short circuit when pierced by "jaw" clamps. An economical aluminum version discourages copper theft and comes in various designs, with "cool" connectors. In cooperation with Eletropaulo, 120 km of anti-robbery cable of five different sizes were installed for the Paraisopolis Social Project in São Paolo (Brazil).



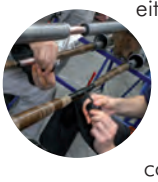
• High-voltage DC cables deliver high power capacity over longer distances, in both terrestrial and submarine conditions. Nexans HVDC submarine cables are connecting Northern Ireland and Scotland, while another cable runs under the Channel between Dover and Calais. An Integrated Return Conductor eliminates the magnetic field, thus protecting the marine environment.



RELIABILITY AND SECURITY

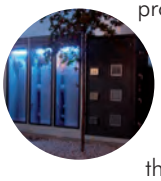
To ensure network reliability and security you need to maintain your network in the best possible state and improve it through products, solutions, services and training. Nexans protects the value of your network over time, and facilitates upgrades in the most cost-efficient, logical way, always taking into account factors like climate, population density and available right-of-ways.

• Only an active manufacturer of traditional fluid-filled cables and accessories and latest-generation XLPE cables can provide Through-Life Support,



either as single modules adapted to special needs, or as a complete service package which includes predictive, preventive and corrective maintenance, and emergency intervention. Nexans is maintaining networks for power utilities worldwide.

• For Vattenfall in Germany, Nexans installed the world's first Superconducting Fault Current Limiter in a power plant to provide short-circuit



protection for the internal medium voltage power supply (12kV) that feeds coal mills and crushers in a brown coal power plant. This system can get a 63 kA short-circuit current down to 30 kA instantaneously and down to 7 kA in less than 10 milliseconds, thus providing unparalleled protection.

• To merge energy and data networks, Nexans has developed compact Ethernet i-switches especially designed for energy providers. Within an integrated network (including optical fiber and passive components), i-switches support all security mechanisms: customer identity, authentication, access, surveillance, telecontrol, transformer monitoring, automatic meter reading, etc.

• Nexans is dedicated to keeping expertise alive through special training programs for its customers. The Nexans HV Training Center, based in

Switzerland, and MV Power Accessories in France aim at standardizing installation and methodology, and providing theoretical and basic training for everyone involved in cable systems: jointers, engineers, maintenance personnel, network managers, etc.

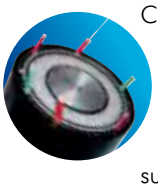
• To expand and develop Qatar's electricity utility, KAHRAMAA, to meet the rapid increase in demand, Nexans

implemented six underground power links to reinforce and extend the high-voltage network serving Doha, the country's capital. This major turnkey project included design, development, supply and installation of 96 km of 66 kV and 132 V singlecore cables and accessories.

FLEXIBILITY

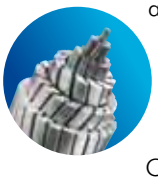
To respond to growing demand and provide uninterrupted power to customers, networks need to accommodate energy from any source, including minigrids, photovoltaic rooftop arrays, fuel cells, or windparks. Centralized generation and control need to give way to distributed generation and intelligence so that power can be exchanged on the open commodity market.

• Nexans makes it possible for you to adapt load management through real time temperature rating systems for cables.



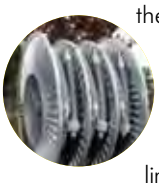
Cable Distributed Temperature Sensing uses optical fiber units in the surrounding sheath to determine temperature profiles, detect hotspots (due to hot water pipes, etc.), and control and monitor cable load. Temperature measurement is possible at 2 meter intervals over a 30 km length of cable.

• To assure operational flexibility for overhead lines, Nexans offers a range of high-capacity conductors



and accessories for the most varied climatic conditions. Aluminum Conductor Steel Supported (ACSS) cables eliminate sag at very high temperatures (250°C). Hundreds of kilometers have been provided to European and North-American Transmission System Operators.

• Temporary construction site cables are HV replacement cables that are used during



the maintenance, repair and modification of your overhead lines, transformers and substations. They provide a temporary "bridge" or a source of emergency power. They can either be purchased or rented, and allow you to reduce outages and increase the availability of all your network assets.

• A Nexans retrofitting solution saves civil engineering, installation costs and the time

required to expand your network. Existing pipes for housing fluid-filled cables are re-used to accommodate next-generation XLPE cables. With a range of high-voltage cables available, a power transmission network can continue to grow flexibly according to actual power needs, and in a sustainable way.

• When you do a repair, you want to have exactly what you need when you need it. Nexans provides MV customized accessory kits on site for greater flexibility.

They contain all needed equipment and pre-connectorized, pre-cut cables needed to splice in replacement cable or make a connection. This decreases outage time, and lowers the risk of error and repeat failures.

ECO-FRIENDLINESS

To meet public concerns about the environment and energy sustainability, power providers want safe practices at every level: from diverse power generation to domestic household wiring. Nexans not only protects the environment through safe materials, designs and installation, but prolongs your network's lifetime by assuring safe removal, replacement and recycling.

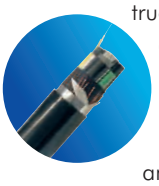
• Nexans supplies a full range of WINDLINK™ cables to virtually every wind turbine manufacturer worldwide, and has been instrumental in developing environmentally-friendly infrastructure solutions both onshore and offshore.

Technical expertise is often provided at the design phase; we have been present in projects like Horns Rev (Denmark), Sheringham Shoal (UK) and Alpha Ventus (Germany).

• Because power utilities want to assure low impact on the environment, Nexans has long since started to eliminate lead in its screens, and has now pioneered a new compact HV cable with a welded aluminum laminated screen. This makes it possible for you to have much longer lengths on reels during installation, fewer connections and less maintenance. France's RTE has already specified this kind of cable in its network.

• Nexans has patented a safe way for draining oil in cables with a special eco-friendly mixture that reduces residue to a minimum. Cables are recycled as secondary raw materials (copper, aluminum and plastics) through Recycable (owned jointly with Sita).

• For distribution, Nexans has several MV underground applications. Directly Buried Cables free the skyline from overhead lines, and reduce truck movement and burial activities to a minimum. Hybrid power and fiber-optic cables provide important multifunction capacity for enhanced monitoring and control. Smart accessories, able to supply information, allow you to keep a constant eye on your network.



• Nexans Life Cycle Assessment makes it possible to compare and determine the best environmental solution for your network. Using this method, the ecological footprint of a product can be measured, from raw material extraction to end-of-life disposal, and includes production, distribution and use. An environmental declaration allowed Iberdrola (Spain) to choose the best solution with confidence.

Smarter power grids: towards an "internet" of energy

Nexans wants to support its customers in achieving the four drivers of the energy business: **Efficiency**, **Reliability and Security**, **Flexibility** and **Eco-friendliness** in the most cost-efficient way.

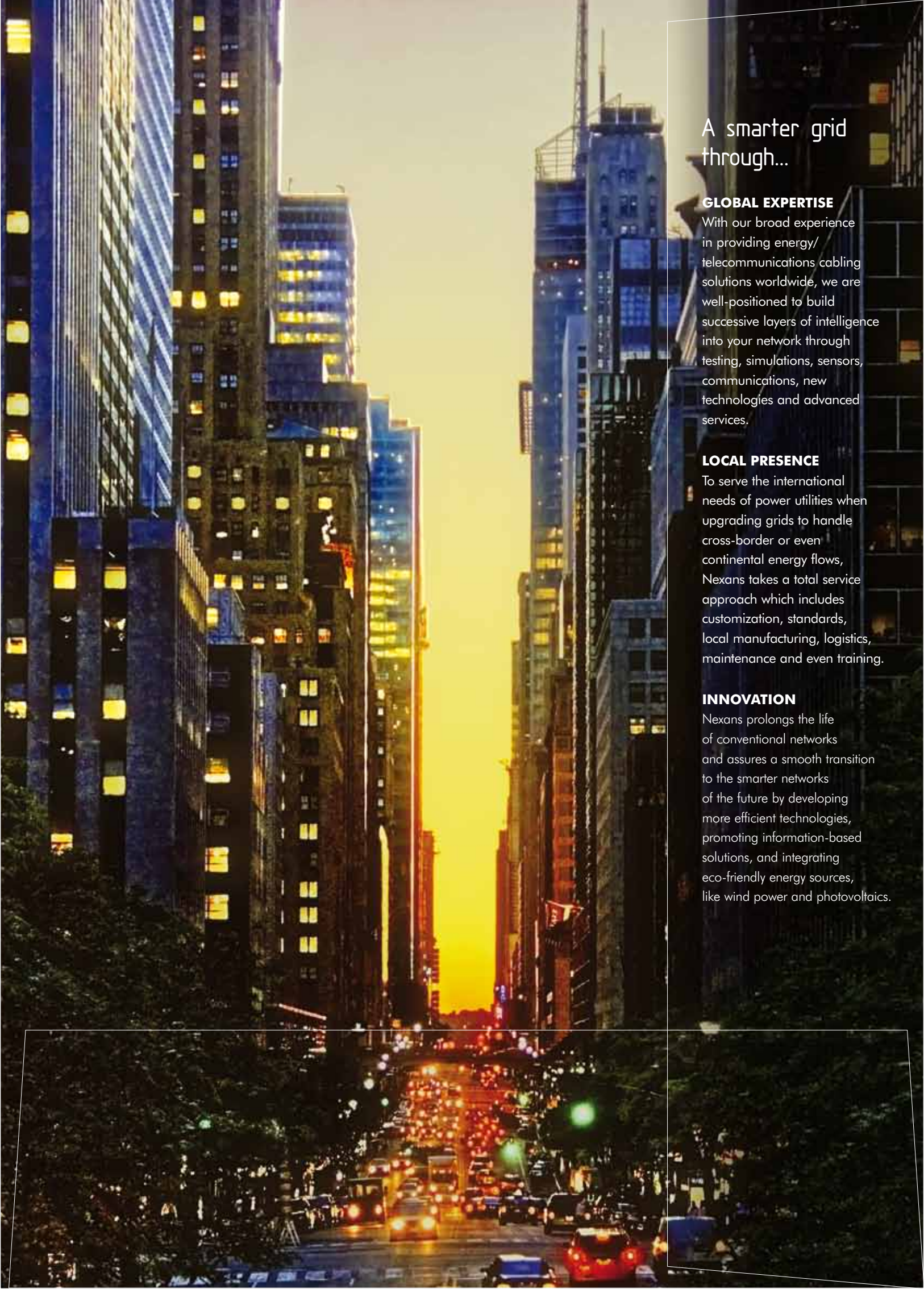
With energy as the basis of our development, and a strong telecommunication background, we are uniquely placed not only to supply complete cables and cabling solutions for power generation, transmission and distribution networks, but also to furnish the decisional tools and technical means required to increase capacity, reduce losses and meet the challenges of congestion, bottlenecks and blackouts.

More than just producing cables, Nexans is committed to providing you with the support, expertise, assistance, design input, services, maintenance and planning you need to move upwards towards the information-rich power network through five successive stages:

- New technologies
- Communications
- Sensors
- Simulation
- Products, solutions and services

As experts in network engineering, we can help you build a smarter network today, and a truly smart grid tomorrow offering:

- faster response to consumer peak demand
- optimal network design and the elimination of weak links
- telecommunications for monitoring, control, and management
- incorporation of "green" energy in bi-directional flows
- life-time maintenance and timely technological upgrades
- environmental responsibility and safe recycling



A smarter grid through...

GLOBAL EXPERTISE

With our broad experience in providing energy/ telecommunications cabling solutions worldwide, we are well-positioned to build successive layers of intelligence into your network through testing, simulations, sensors, communications, new technologies and advanced services.

LOCAL PRESENCE

To serve the international needs of power utilities when upgrading grids to handle cross-border or even continental energy flows, Nexans takes a total service approach which includes customization, standards, local manufacturing, logistics, maintenance and even training.

INNOVATION

Nexans prolongs the life of conventional networks and assures a smooth transition to the smarter networks of the future by developing more efficient technologies, promoting information-based solutions, and integrating eco-friendly energy sources, like wind power and photovoltaics.

Global expert in cables and cabling systems

With energy as the basis of its development, Nexans, the worldwide leader in the cable industry, offers an extensive range of cables and cabling systems. The Group is a global player in the infrastructure, industry, building and Local Area Network markets. Nexans addresses a series of market segments: from energy, transport and telecom networks to shipbuilding, oil and gas, nuclear power, automotives, electronics, aeronautics, material handling and automation. With an industrial presence in 39 countries and commercial activities worldwide, Nexans employs 22,700 people and had sales in 2009 of 5 billion euros. Nexans is listed on NYSE Euronext Paris, compartment A.

Nexans S.A. – 8, rue du Général Foy – 75008 Paris – France
Tel.: +33 (0)1 73 23 84 00 – Fax: + 33 (0)1 73 23 86 38 – www.nexans.com
marcom.info@nexans.com

Document printed on paper PEFC 100% Cert. No PEFC/10-31-1232 from sustainably-managed forest. 03/2010 B:K Credits: © Getty images - Fotolia - Ingram - Digital Vision - Corbis -.