Smarter Grid solutions to future-proof your energy network
A smarter grid...

To satisfy the high demand for electrical power, grids are evolving from static infrastructures to two-way dynamic networks based on sensors, digital communications, and sophisticated management systems to assure energy efficiency, reliability/security, and eco-friendliness.

Consumers are now active producers ("prosumers") through photovoltaic rooftop installations (and soon, EV fuel cells). Generation plants are incorporating renewable sources and finding new ways to manage peak loads. Transmission/distribution networks use smart-metering, communications and automation to reduce power losses and improve Quality of Service. All this is happening amid public clamor for clean energy and lower carbon emissions.

Nexans offers a complete range of solutions and services you need to create a Smarter Grid which can:

- Respond faster to peak demand
- Foresee and manage consumption
- Incorporate renewable energy
- Assure full monitoring and control
- Reduce losses, congestion, blackouts
- Cut pollution and carbon emissions
- Reinforce life-time maintenance

Nexans provides you with the expertise, design input, maintenance, and planning you require to find the most appropriate “smarter” solution for you.

Drawing on our proven experience in energy and telecommunications, Nexans is your best partner to create an information-rich power network worthy of your business in the 21st Century.
Nexans provides four stages of “smartness” ranging from basic power infrastructure to sensors, advanced communications and new technologies to serve an evolving or a completely new grid.

These solutions bring efficiency, reliability and eco-friendliness to networks, creating tangible benefits, not only for generation plants and consumers, but especially for transmission and distribution.

For Smarter Transmission

New Technologies
- Long length high capacity transmission with extruded HVDC cables
- Lighter and longer Composite Core Overhead Lines
- Compact and high power links and lower thermal and EMI impact with Superconductors

Communication
- Enhanced network condition monitoring via Optical i-Switches

Sensors
- Improved safety/operations with Real-Time Temperature Rating (hotspots, power load)
- Increased transmission capacity, enhanced reliability and efficiency with Dynamic Line Rating
- Reduced maintenance and repair with Partial Discharge Detection

Power Infrastructure
- A wide range of HV cables and accessories reinforce transmission grids and integrate renewables in the most efficient way

For Smarter Distribution

New Technologies
- Ultra-high power distribution with Superconducting Cables
- Short-circuit protection with Fault Current Limiters

Communication
- Optimized operations with Power Line Communication
- Monitoring and smart metering using Optical i-Switches

Sensors
- Reduced maintenance using Smart cables and accessories to monitor temperature, voltage, current, partial discharges, etc.

Power Infrastructure
- A wide range of MV & LV cables and accessories reinforce distribution grids and integrate renewables in the most efficient way

...for future operational benefits
Transmission

**High-voltage Direct Current extruded cables**:
HVDC electric power transmission uses direct current for long-distance bulk transmission of electricity, outperforming AC systems.

**Lo-Sag Overhead Lines**:
The carbon core carries most or the entire mechanical load of the conductor, dramatically reducing sag. Capable of handling temperatures up to 180°C.

**HV and HVDC Superconducting cables**:
These innovative breakthroughs deliver unique characteristics in terms of power transfer, low impedance, lower magnetic fields and reduced thermal impact.

**Optical i-Switch solutions**:
Merging energy and data networks, Nexans developed compact Ethernet i-Switches designed for energy providers. Integrating copper and fiber, they provide excellent communications and support all security mechanisms.

**Distributed Temperature Sensing/Real-Time Temperature Rating**:
HV cable equipped with optical fibers which measure temperature and monitor power along the line.

**CAT-1 Dynamic Line Rating System**:
Completely integrated sensor, communication, and software system that delivers up to a 30% increase in power transfer on new and existing transmission lines. The system seamlessly integrates with each utility’s existing Energy Management System to optimize power flow, grid reliability, and transmission asset utilization.

**Partial Discharge Detection**:
Sensors embedded in the joints allow a real-time follow-up of any partial discharge phenomena located close to cable joints and terminations.

**HV Cables, Accessories and Services**:
Nexans provides a full range of HV cables and accessories, reinforcing grids in the most efficient way. We also provide multiple services like audit, maintenance & repair, installation, upgrade, customer training & support,...
Distribution

**MV and High Current Superconducting cables**: These innovative breakthroughs deliver unique characteristics in terms of high power transfer capacity and very low impedance, lower magnetic fields and thermal impact.

**Superconducting Fault Current Limiters**: Superconducting materials provide fail safe, low loss, and maintenance-free solutions to effectively protect networks against fault currents.

**Power Line Communications**: Nexans promotes the use of G3-PLC for communication on the power network.

**Optical i-Switch solutions**: Merging energy and data networks, compact Ethernet i-Switches integrate copper and fiber to support customer identity, authentication, access, surveillance, telecontrol, transformer monitoring, automatic meter reading, etc.

**Electric Vehicle Infrastructure**: Fully equipped with sensors and communications, Nexans EV infrastructure solutions assess network power availability for EV charging.

**Smart Cables and Accessories**: Provide information about key network parameters.

**MV/LV Cables, Accessories and Services**: Nexans provides a full range of MV and LV cables and accessories to reinforce distribution infrastructure. We also provide multiple services like audit, maintenance & repair, installation, upgrade, customer training & support,...
Smarter Grids are much more than smart metering and renewed infrastructure. They involve improvements at every level of generation, transmission/distribution and consumption.

As daily operations shift towards remote monitoring and predictive time-based maintenance, Communications will play an ever greater role… with meters, sensors, and switches communicating with each other nonstop.

Through constant innovation, Nexans is spearheading change, offering solutions that vastly improve network architecture, performance and customer service, while protecting the environment.

- **High-performance overhead lines**
  Composite core conductors allow wide spans (up to 2.5 km), reducing the number of pylons, and lowering the height and cost of towers. They greatly increase transmission capacity over long distances.

- **Discreet intra-urban networks**
  Superconductors transport five times more power than standard cables of the same diameter with no electromagnetic or thermal impact. Nexans’ AmpaCity project in Essen, Germany, will be a world record-holder for length: one kilometer of 10 kV cable, using only one right-of-way and no transformers. A single cable can resolve limited space and environmental restrictions.

- **Superconducting Fault Current Limiters (SFCLs)**
  Nexans is the world leader in resistive SFCLs. These maintenance-free devices instantaneously shut down a short circuit in milliseconds in a power transmission network or large industrial park. With 13 partners, including five European grid operators, Nexans is coordinating ECCOFLOW, the European second-generation, multi-purpose Superconducting Fault Current Limiter project.

- **Advanced two-way communications**
  Nexans promotes the use of G3-PLC for communication on the power network.

- **Land & submarine HVDC for long distance transmission**
  Paper-insulated and XLPE High-Voltage DC cables deliver more power over longer distances than AC solutions. Nexans HVDC link between Norway and the Netherlands is the longest in the world (580 km). Nexans also operates one of the world’s largest cable-laying ships, and has developed its own family of cable-laying Capjet ROVs.
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 sensors, communications, and new technologies.

LOCAL PRESENCE
To serve the international needs of power utilities to handle cross-border or continental energy flows, Nexans takes a total service approach which includes customization, standards, local manufacturing, logistics, maintenance and 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.
With energy at the basis of its development, Nexans, worldwide expert in the cable industry, offers an extensive range of cables and cabling solutions. The Group is a global player in the energy transmission and distribution, industry and building markets. Nexans addresses a wide series of market segments: from energy and telecom networks to energy resources (wind turbines, photovoltaics, oil and gas or mining, etc.) to transportation (shipbuilding, aerospace, automotives and automation, railways, etc.). Nexans is a responsible industrial company that regards sustainable development as integral to its global and operational strategy. Continuous innovation in products, solutions and services, employee development and commitment, customer orientation and the introduction of safe industrial processes with limited environmental impact are among the key initiatives that place Nexans at the core of a sustainable future. With an industrial presence in 40 countries and commercial activities worldwide, Nexans employs 25,000 people and had sales in 2011 of 7 billion euros. Nexans is listed on NYSE Euronext Paris, compartment A.