Nexans

Electrification solutions to optimize
your power networks and contribute to sustainable development

National energy empowerment depends on...

Governments are well aware that electrification is the key to robust economic growth, touching all aspects of life: commerce, productivity, education, communications, health and comfort.
Over 1.6 billion people are still without electricity, which represents about a quarter of the planet's population, most of them living in peripheral urban and isolated rural zones.
With world net electricity generation expected to double by 2030, developing countries are forecasted to have the strongest growth: some 4% annually.

As a national or regional power utility, you are faced with rising demand both in dense urban areas and remote scattered villages.
This often means extending grid capacity for strategically-placed thermal power plants or distant hydro-electric stations through new and more efficient overhead lines.
You are also anxious to safeguard revenues by improving service, and reducing energy and cable non-technical losses.

In rural areas, you want to make sure that high service costs per customer are offset by local resources, often via mini-grids based on small-scale hydropower and hybrid systems combining wind power, photovoltaics, biomass and diesel generators.
Given high fuel costs and environmental concerns, you are fully committed to renewable energy and self-sufficiency.

What you expect from a cable expert:

- Full knowledge of generation, transmission and distribution technologies
- Complete range of cables, fittings and accessories for safe, reliable operations
- Engineering support in network design, conductor type and line monitoring
- Cost-efficient cables and solutions especially adapted to your terrain
- Control, data and telecom cables for efficient grid management
- Ability to transport, deliver, install and maintain anywhere in the world

...a reliable source of sustainable electricity

Nexans contributes to the reliability and security of energy networks around the world by increasing capacity and reducing technical and non-technical losses through affordable, state-of-the-art technology. We are also dedicated to merging both conventional and renewable sources of energy in the most cost-effective way possible, thus creating new opportunities, protecting the environment and contributing to sustainable economic and social development. Nexans meets the three challenges that developing countries face in providing their populations with low-cost, accessible energy:

• The challenge of size and distance

Mega hydroelectric projects like Three Gorges Dam (China), Cahora Bassa (Mozambique), or the Inga III and Grand Inga (DR Congo) offer tremendous power potential; however energy must be carried long distances over rugged terrain to reach power-hungry cities. Nexans not only supplies all of the power and telecom cables needed to run a large power plant, it can also transport energy through overhead conductors offering advantages like improved capacity, less energy loss, lower sag, and fewer towers over longer spans for important cost savings.

• The challenge of remoteness

With 67% of the world's rural population in developing countries without electricity, governments are committed to electrification. Nexans supports these initiatives by finding cheaper and better ways to transmit and distribute energy in the countryside via bare medium-voltage overhead lines and standard Aerial Bundled Cables (ABC), which have been installed throughout Africa, Asia and South America. Our experience in wind turbines, photovoltaics and other renewables also supports mini-grids and eventual large-scale desert Solar Thermal Energy (STE) projects.

• The challenge of urban density

Imploding cities pressured by growing suburbs have an impact on power utilities who are faced with high demand, overload, low capacity, power losses and outright electricity theft. Nexans provides utilities with network design and LANs solutions for secure energy management, in addition to ABC and direct-buried cables to upgrade infrastructure and allow pre-paid metering. In addition, we have developed an entire family of innovative and low-cost "anti-robbery" overhead cables that have allowed utilities to control bad debt, discourage fraud, and assure secure and reliable energy for consumers. Nexans has also helped co-develop a social program about the safety and advantages of legal electricity.

A wide range of reliable cable solutions...

GENERATION

Low, medium and high-voltage underground XLPE cables

Copper or aluminum XLPE energy cables are used to connect generators to switchgears and transformers in all kinds of power plants worldwide: hydro-electric, coal-fired, oil and gas-burning. They also connect multiple turbines of wind parks before linking them to the grid.

Given the recent proliferation of wind power in India, China, Costa Rica, Brazil, Morocco and Egypt, these cables are also favored for inter-generator connections on windfarms.

LAN power plant cabling systems

To ensure power plant and infrastructure management, telecommunications and security, Nexans has both advanced fiber and copper LANs/WANs solutions.

The high data speeds now achievable (up to 10 Gbit/s) mean that power utilities in developing countries can plan a decade ahead without expensive retrofitting.

Control/pilot, instrumentation, fieldbus cables

For generating stations and substations, these critical cables control turbine/generator functions, switching operations, pumping systems and network monitoring to ensure management of the power generation unit.

Instrumentation, sensor and fieldbus cables have created a new level of digital control for power generation and grid monitoring.

TRANSMISSION

ACSR: Aluminum Conductor Steel Reinforced

A conductor with a steel core and outer layers of pure aluminum; widely used, this time-proven conductor assures reliable and durable performance.

Nexans has provided this conductor to many operators with long distances to cover in South-East Asia, and the Americas.

ACAR: Aluminum Conductor Aluminum Reinforced

A customized conductor with an aluminum alloy core and an outer layer of pure aluminum, it offers high ampacity (i.e. current rating). However, its lower mechanical strength does not allow it to be unduly stretched.

ACAR is much appreciated in parts of South America where there are no snow/ice or violent storms to cause sagging or line tension.

AAAC: All Aluminum Alloy Conductors

By replacing both steel core and outer layers of pure aluminum with aluminum alloys, this conductor is stronger than conventional ACSR, and more resistant to corrosion.

Developed in Europe, and widely used in Belgium and France, these conductors are also deployed in many African countries, like Algeria, Congo and Niger.

Nexans advanced Aero-Z® design

For all the foregoing conductors, in addition to the conventional design with round wires, Nexans can also supply a compact design with Z-shaped interlocking wires. It reduces drag (i.e. pressure on lines due to strong winds), minimizes "galloping," lowers corrosion, and raises ampacity by 10% in an equivalent diameter, or reduces Joule losses by 15% at the same ampacity. Aero-Z® has equivalent accessories, and can be installed in the same way and with the same equipment as conventional conductors.

An African premiere: Nexans installed 132 kV- AAAC-Aero-Z conductors on a 264-km-long line between Nigeria and Niger. Combined with energy compensation, this allows a total increase of electrical capacity by 75% between the two countries. Nearly 900 km of the same conductor were also recently installed in Peru to resolve corrosion and corona loss issues.

Low, medium and high-voltage underground XLPE cables

MV Direct Buried Cables

ACAR: Aluminum Conductor Aluminum Reinforced

Nexans advanced Aero-Z® design

Control/pilot, instrumentation, fieldbus cables

Anti-robbery LV overhead cables

Aerial Bundled Cables (ABCs)

AAAC: All Aluminum Alloy Conductors

...to help you bridge the energy gap

URBAN AND RURAL DISTRIBUTION

LAN power plant cabling systems

ACSR: Aluminum Conductor Steel Reinforced

Aerial Bundled Cables (ABCs)

Low voltage XLPE aluminum-alloy ABC cables are used to provide electricity from the transformer to the customer, and can be used on both poles and building walls. Cheaper than buried cables, they are easy to install and reduce the risk of electrical shock and fire. They are available in three versions (with insulated or bare neutral messenger, or with four self-supporting conductors) and are fully adapted to urban, suburban and rural environments.

Thousands of km of Nexans' ABCs are being installed by the power utility, Tatenergo, in the Republic of Tatarstan (Russian Federation). Nexans provided 50% of cables for Morocco's Office National de l'Electricté's (ONE's) rural electrification program. They are also used in Senegal, Mali, Burkina Faso, Algeria, Nigeria and Tanzania.

Anti-robbery LV overhead cables

To counter significant energy losses by utilities (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: one or three-phase concentric, and bi-concentric and tri-concentric versions to increase capacity. Nexans "cool" aluminum connectors efficiently reduce "heat points" on urban overhead lines.

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).

MV Direct Buried Cables (DBCs)

This 3-phase 10 to 30 kV cable was developed for reliable, low-cost rural distribution. A tough High Density Polyethylene (PEHD) outer sheath extruded around the bundle allows it to be buried directly in the ground without needing a layer of protective sand, or rollers to pull the cable. Excavated earth is simply used as backfill. This design significantly lowers installation cost and prevents damage during cable laying.

DBCs have been used in Gabon, where loose soils have made it possible to quickly pull or bury them in safe, narrower trenches without having to use heavy machinery.

Services to meet your power goals

GLOBAL EXPERTISE
Nexans understands overall energy concerns in developing countries. This includes power generation of all types, long-distance transmission through difficult and often inaccessible terrain, and reliable and secure distribution in both dense cities and distant rural areas.

LOCAL PRESENCE
With our energy cables qualified in many countries around the world, we are well-positioned to take on multi-supplier projects with international Power Pools and consulting engineers. We can even count on our own local manufacturing plants to provide utilities with the appropriate cable on the spot.

TECHNICAL LEADERSHIP
Given the rising cost of primary energy fuels and the need to ensure long-term self-sufficiency, we seek innovative ways to get the most out of existing resources, while exploring new opportunities in renewable energy, like wind power, photo-voltaic technologies and Solar Thermal Energy.

INNOVATION is at the core of our overhead lines

Nexans has energy transmission and distribution teams at our Research Center in Lyon (France) and at our Metallurgy Center in Lens (France). They draw on the collective knowledge of the 600 researchers and engineers group wide. Our metallurgy experts are continuing to experiment with new, cheaper and more efficient alloys. Nexans constantly adds value to cables and conductors in terms of technical knowhow and electrical engineering, while supporting complete networks through design, line management, and fully integrated accessories.

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 & gas, nuclear power, automotives, electronics, aeronautics, material handling and automation.

With an industrial presence in more than 30 countries and commercial activities worldwide, Nexans employs 22,000 people and had sales in 2007 of 7.4 billion euros. Nexans is listed on Euronext Paris, compartment A.

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