

ABB POWER GRIDS

Solutions for enabling a stronger, smarter and greener grid



Electricity is the most versatile and widely used form of energy and global demand is growing continuously. Generation of electrical energy is, however, a major source of carbon dioxide emissions, making a significant contribution to climate change. To mitigate the consequences of this, the current electricity grid needs to undergo a big shift.

A considerable amount of future electricity will come from renewable energy sources, reducing dependence on fossil fuels and lowering emissions in the long run. These renewables need to be integrated into grids that are able to manage new complexities such as intermittent supply, more distributed power generation, demand management and electric vehicles. So, the evolving power system needs to be increasingly flexible and interconnected, as well as more reliable and intelligent – what we need, in short, is a stronger, smarter and greener grid.

Solutions for a stronger grid



Grid reliability

Demand for electricity is rising each year while the world works towards a low-carbon future. Transmission system operators need to adapt to enhance the flexibility and reliability of their grids. This includes integrating renewable energy and improving capacity and accommodate the demands of deregulated power markets. ABB is the world's largest manufacturer of power transmission and distribution equipment, helping to ensure grid reliability.



Ultra-high-voltage transmission

Urban centers are often based far away from power sources. ABB is a pioneer of ultra-high-voltage transmission, which efficiently transports energy by means of alternating current (AC) or direct current (DC) from where it is available to where it is needed. As the technology evolves, greater levels of power can be transported over longer distances with minimal losses.



Energy storage

The power landscape is changing dramatically. We're moving to a world where power can be stored without the need to use fuel as a back-up. This shift takes us closer towards a low-carbon future. ABB has developed energy storage technologies that serves power requirements ranging from tens of kilowatts up to hundreds of megawatts. It's an area of constant evolution for us.



Power quality

Power quality is a major concern for utilities, industries, transport and infrastructure segments. Billions of dollars in revenue are lost each year as a result of power quality issues that cause hours of downtime, lost productivity and, possibly, the need to repair or replace equipment prematurely and lead to higher energy bills. With the right diagnosis and treatment, both utilities and consumers can alleviate power quality issues. ABB offers a wide range of products, systems and services that improve power quality across the power value chain in low, medium and high-voltage applications.



Case study

Helping CenterPoint Energy weather the storm

CenterPoint's system had been upgraded in 2008 after Hurricane Ike, to include ABB Ability™ Network Manager advanced distribution management system for its 2.4 million metered customers. The system uses information from the customer's advanced meters and field sensors to enable real-time grid monitoring and control and is integrated with ABB's mobile workforce management software as well as an advanced outage analytics package. When the storm hit, CenterPoint was able to quickly identify, isolate and restore power quickly and efficiently for a stronger, more reliable grid.

Solutions for a smarter grid



Digital grid

The digitalization of the entire electricity system is an exciting area of development. We are witnessing unprecedented changes in both transmission infrastructure and the way it is operated. Operators now face the challenge of digitalizing age old infrastructure to meet new regulations and address other areas such as allowing distributed energy and implementing cyber security protection measures.

The ABB Ability™ technology platform brings together all of our digital capabilities. Our portfolio comprises more than 180 digital solutions to create digitally connected devices, systems and services.



Microgrid solutions

ABB has unmatched expertise in designing and building off-grid and grid-connected microgrids. Our portfolio encompasses the full range of enabling technologies including conventional and renewable power generation, automation, grid stabilization, grid connection, energy storage and intelligent control technology, as well as consulting and services to enable microgrids globally.

Our microgrid solutions ensure power supply resilience, power quality, sustainability and cost-effectiveness in a broad range of applications.



Cyber security

Security today is a lot more than protecting against cybercrime: data as well as connections need to be safe. ABB provides in-depth security required for digital solutions in mission-critical applications and industries.



Smart cities

Cities around the world are challenged to sustainability accommodate increasing populations, or to become more sustainable, competitive and livable. ABB products and solutions are at the heart of a city's critical infrastructure, relied upon for everything from the supply of power, water and heat, to the automation of the factories and buildings we work in.



Case study

Harnessing sustainable energy for remote Alaska communities

ABB partnered with the communities of Deering and Buckland to install advanced modular “plug-and-play” microgrids that will leverage proven ABB Ability™ Microgrid Plus automation system and PowerStore™ storage technology, to maximize the adoption of wind power. Incorporating more renewables will also help the communities to lower costs and support the objectives set out by NANA Regional Corporation, Inc. (NANA), the local utility to reduce reliance on imported diesel by up to 75 percent, by 2030.

ABB's advanced Microgrid Plus control solution will manage the sophisticated automation of hybrid systems while ensuring secure power supplies with an optimal renewable energy contribution. With the deployment of ABB's PowerStore Battery technology, these remote Alaska communities will be able to achieve up to 100 percent renewable penetration and pursue a sustainable future.

Solutions for a greener grid



Renewable integration

The growth of renewable energy means that grids need to adapt to changing energy sources, such as wind and solar. Some grids may have limited capacity to cope with larger amounts of energy or unpredictable weather patterns. ABB integrates grids with new forms of energy, providing a full service from consulting, generation and connection to transmission, monitoring and control, as well as maintenance and optimization.



Environment & energy efficiency

There are many opportunities within utilities and industry to improve energy efficiency and provide cost savings. ABB can help customers improve energy efficiency by providing specialists to audit energy use and identify areas for improvement. We also offer energy efficient equipment, products and systems.



Distributed energy resources

Distributed energy resources (DERs) are reshaping the operation of the electric power system. DERs are becoming more commonplace and utility companies must integrate these new resources into their existing networks. ABB's Distributed Energy Resource Management System enables utilities to manage the entire lifecycle of DERs – from registration to optimization – while ensuring safe, secure and efficient operation of the electric distribution network.



Sustainable transportation

Economic growth, rapid urbanization and the move towards a low-carbon society are driving the transformation to sustainable transport. ABB services the rail and transportation industries, both urban and long-distance, with a range of power and automation products and solutions.



Case study

HVDC Maritime Link enables exchange of clean, reliable power

The Maritime Link is a 500 megawatt (MW) high-voltage direct current (HVDC) connection that will enable clean, renewable energy, generated in Newfoundland and Labrador to be transmitted to the North American grid in Nova Scotia reducing dependence on fossil fuels.

The stabilizing features of ABB's solution will also allow Nova Scotia to integrate additional renewables such as wind power and contribute to Canada's emission-reduction efforts.

ABB's proven HVDC Light® technology will enable the historical Maritime Link project to integrate and deliver clean renewable energy while enhancing grid stability and enabling power sharing.



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