

Trends influencing ABB



Power and automation, our core activities, are undergoing a transformation.

With the surge in demand for renewable energy, power grids are becoming increasingly complex. Wind and solar are unpredictable sources of power, and the proliferation of rooftop solar panels is turning millions of consumers into producers of electricity.

Furthermore, hundreds of millions of people are still without access to electricity, while the best sources of renewable energy – such as windy offshore sites, sunny deserts and steep valleys – are usually far from the cities and industries that use the power. In these conditions, new solutions are needed to improve the efficiency and reliability of the power supply that is so critical to the wellbeing of families and businesses alike.

In industry, the revolution in digital technology is opening up new possibilities to increase productivity. A new industrial era is beginning, in which machines are increasingly able to perceive their surroundings and interact with human beings, creating the Internet of Things, Services and People.

In the next stage, these developments will converge with advances in industrial artificial intelligence and machine learning. Machines will in future not only be able to perceive the world and communicate with each other but also to reason and make decisions, without the need for human intervention.

The grid of the future

Rising demand for renewable energy is transforming the power grid and driving a new wave of innovation in the generation and distribution of electricity.

The power sector is undergoing change on a scale not seen since the era of mass electrification began over a century ago. The old model of power flowing in one direction, from generating plant to consumer, is being turned upside down, as rooftop solar turns consumers into producers of electricity. At the same time, electricity is being transmitted over longer distances as offshore wind farms and remote solar plants are integrated into the grid.

Managing this complexity is only possible with new technologies. These technologies can prevent intermittent wind and solar power from disrupting the grid, can handle multi-directional flows of power, and can balance supply and demand. Innovative solutions are managing the flow of electrons. But increasingly they also have to manage the flow of data needed to control the whole system.

With its unrivalled knowledge of electrical energy and industrial automation, and an innovation track record stretching back over a century, ABB is ideally positioned to drive the digital grid. Our offerings cover the entire electrical value chain – from generation, transmission and distribution, to electric mobility. We are at the forefront of technologies such as high-voltage direct current, grid automation and smart grids, as well as energy-efficient motors, drives and industrial automation technologies.



Among ABB's latest power technologies are ultrahigh-voltage direct current transmission, which reduces losses by around 30 percent over long distances compared with conventional power lines, as well as microgrid solutions which incorporate renewables to electrify off-grid communities in places such as Africa and India, where hundreds of millions of people lack access to electricity.

A new industrial era

The revolution in digital technology is ushering in a new industrial era, centered on the "Internet of Things, Services and People" (IoTSP).

Key drivers are the increased availability of data, ubiquitous connectivity, and the exponential growth in processing power. Thanks to these developments, the performance and health of machines can be tracked and monitored throughout their life cycle, boosting productivity and efficiency, for instance by enabling interventions before a service interruption.

At the same time, advances in robotics technology, exemplified by ABB's YuMi – one of the most advanced industrial robots in existence today – are enabling a new era in human-robot collaboration, notably in small-parts assembly.

The next stage in this new industrial era will be driven to a significant extent by advances in artificial intelligence, such as machine learning. Machines will be able to take decisions based on their own analyses of data and to learn from the outcomes of those decisions.

In the industry of the future, we will see factories, mines, mills and offshore platforms run entirely by machines and robots. Human beings will be alerted only when machines encounter problems or issues they cannot solve themselves. The outcome will be a dramatic increase in productivity, leading to new business models and the transformation of industry.

As a world leader in industrial automation and robotics, ABB is leading the way to this new era through the IoTSP, not only with our hardware and engineering expertise, but also with our consulting, service and software solutions.

With our in-depth understanding of industries and their applications, and of the IoTSP, ABB has the knowledge and expertise to deploy the optimum mix between artificial intelligence and classical model-based technologies to bring safety, productivity, and energy efficiency in industry to the next level.