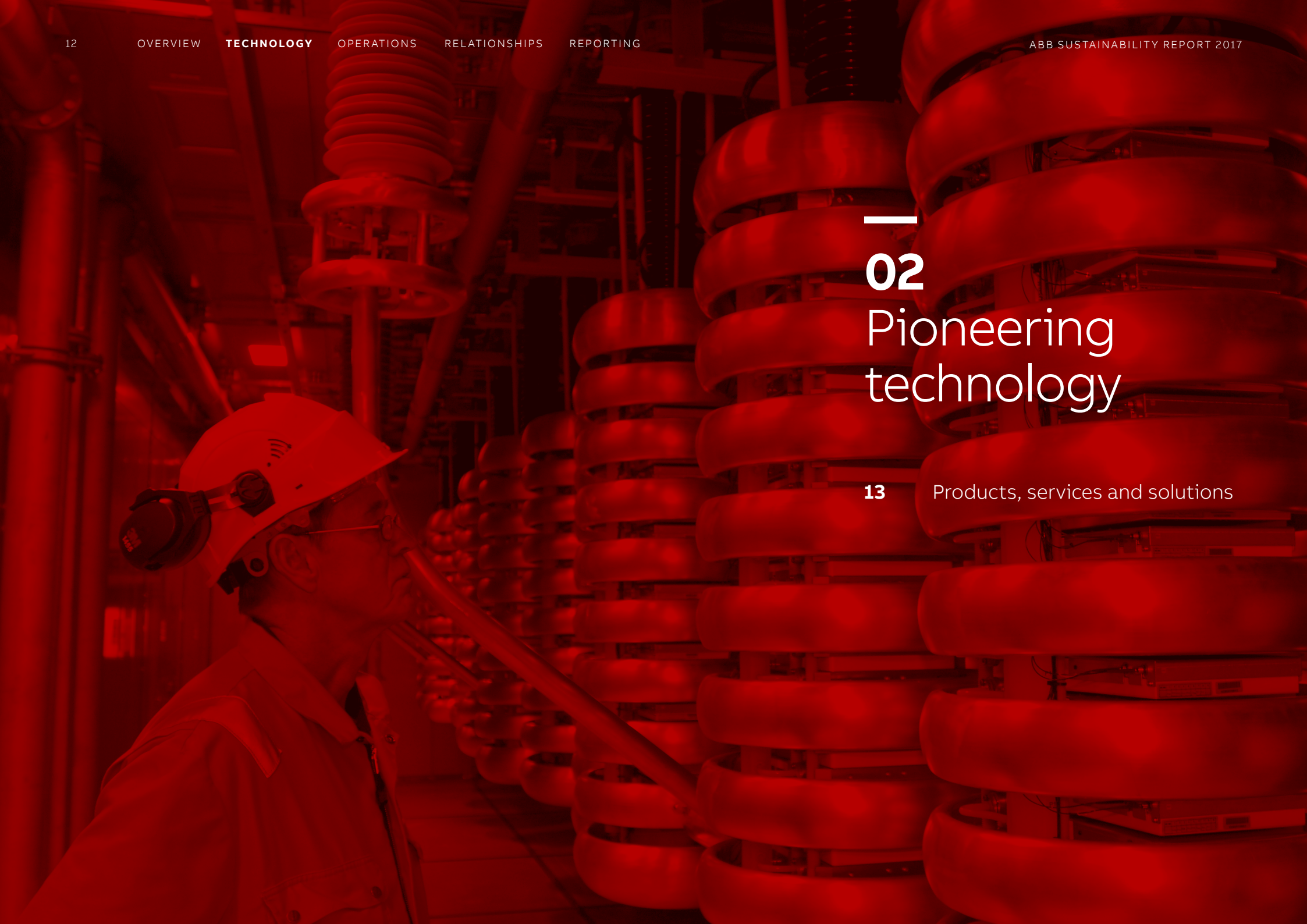


02 Pioneering technology

PRODUCTS, SERVICES AND SOLUTIONS

Pioneering innovative technologies for more than 130 years

Around the globe, ABB drives efficiency, safety and productivity in utilities, industry, and transport & infrastructure

With a heritage of innovation spanning more than 130 years, ABB takes pride in developing and deploying technologies that stimulate economic growth and directly improve people's lives.

In 2017, we revised the measures and 2020 targets for our products, solutions and services to focus on our eco-efficiency portfolio. This portfolio delivers positive use-phase impacts in three areas: energy efficiency, renewable energy and resource efficiency. Going forward, our target is to drive the growth of this eco-efficiency portfolio, aiming for it to account for 60 percent of ABB's total revenue by 2020, supported by substantial investment in research and development.

The rationale behind these changes lies in ABB's deep commitment to running the world without consuming the earth. Our new measures and targets not only reflect this aspiration, but will also serve to propel our company on a new growth path – one that is fueled by sustainability-oriented innovation.

Over the past year, we performed well towards our 2020 target, with our eco-efficiency portfolio accounting for 56 percent of ABB's revenue in 2017.

Sustainable energy

ABB is committed to realizing the vision enshrined in Sustainable Development Goal 7 – ensuring access for all to affordable, reliable and sustainable energy.

Our Group provides much of the technology needed to make this goal a reality. One of our solutions is the microgrid – a small-scale electric grid that can run largely on renewables such as wind or solar, reducing or even eliminating the need for diesel generators in places that lack reliable grid connections. This technology is ideal for remote locations. We recently installed such a microgrid on Robben Island in South Africa, to power the museum and conference center located in the historic former prison of Nelson Mandela.

Another ABB technology that is playing an important role in integrating renewable energy into mainstream power grids is high-voltage direct current, or HVDC. By converting alternating current into direct current for transmission, then back to AC for consumption, we can transmit power with minimal losses over long distances. That makes it possible to connect remotely located energy sources to major consumption centers, like cities.

Case study
ABB enables access to electricity in Africa
Click here to reveal

HVDC systems are now delivering electricity generated by hydro, wind and solar plants to millions of consumers every day. Many of the best renewable generation sites are in remote locations – mountaintops, deserts and seas – so the electricity produced must cross vast distances to get to where it is needed. HVDC is the most reliable and efficient way to ensure that renewable energy reaches consumers.

ABB pioneered HVDC over 60 years ago and has continued to refine the technology, developing ultra-high-voltage direct current (UHVDC) and "HVDC Light." HVDC plays an important part in a stronger, smarter and greener grid, and ABB is one of the world's foremost providers of HVDC systems.

Sustainable engineering from ABB can also be found in digital substations – a key component in next-generation grids, because they enable smarter and greener power systems. The digital substation is an innovative concept that uses fiber-optic current sensors to eliminate much of the copper cabling used in older facilities and connects the latest electrical devices to digital sensors and cloud computing. These cutting-edge substations send real-time operating data to the utilities that run them; ABB Ability enables the operator to use that data to make better operational decisions and optimize maintenance scheduling. The end results include lower maintenance costs, smaller and more efficient facilities, reduced environmental impacts and improved worker safety.

These are just a few of the technologies ABB has developed to use energy more responsibly and to enable the ongoing transition to renewables. Others include a wide range of solar inverter applications and home automation systems, such as Mylos free@home, which makes it possible to build truly smart homes. Moreover, our company is working to ensure that the efficient new grid systems now being installed around the world are built from greener components. Our latest single-phase transformers use biodegradable esters as insulating fluids in place of conventional petroleum derivatives. The use of ester fluids at higher voltage levels has resulted in a safer and greener high-performance transformer solution. ABB's world-first 420 kilovolt single-phase transformers offer an environmentally friendly, energy-efficient and reliable high-voltage alternative for a sustainable future.

Case study
Harnessing wind power
Click here to reveal

Industrial productivity

As so many of the products and services sold by ABB relate directly to issues of sustainability, it is not possible to provide an exhaustive account of them all. Yet, it is worth highlighting the substantial gains in efficiency and productivity generated over the past year by ABB Ability, our Group's comprehensive digital offering, which consolidates and analyzes data from across the industrial internet and provides customers with automated, data-driven information and insights about processes and machinery to increase the uptime, speed and yield attainable from their assets.

ABB Ability connects one of the world's largest installed bases of industrial devices – more than 70 million of them – to industry-leading digital solutions in sectors as diverse as marine, mining, paper milling, printing and food and beverage processing.

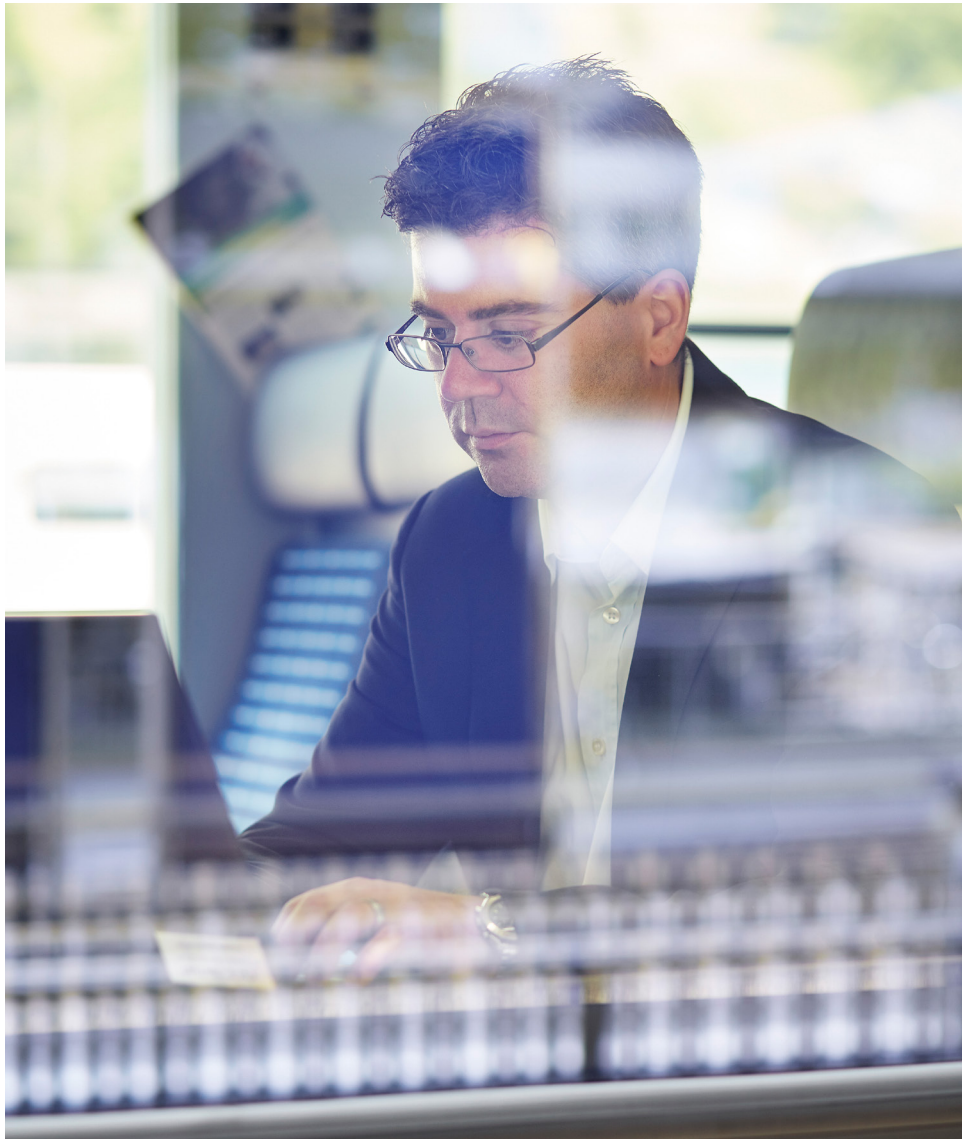
The ABB Ability Smart Sensor, when used to connect low-voltage electric motors to the industrial internet, allows them to be monitored continuously. The installation of these sensors can result in a 10 percent reduction in energy consumption. If all the low-voltage motors around the world were equipped with them, the resulting energy savings would equal the energy output of about 100 large power plants.

Sustainable transport

ABB is a pioneer in the field of e-mobility, having played a key role in the development of electrified railways and urban transit systems. In 2018, ABB initiated a partnership with Formula E, the first fully electric international FIA motorsport class, bringing its name and technology leadership to the racing series, now known as the "ABB FIA Formula E Championship." ABB entered this partnership with Formula E both to promote the rapid adoption of electric vehicles and to emphasize our own role as the world's largest provider of fast-charging equipment for electric cars and buses.

In the fight against climate change, transport technologies present a tremendous opportunity. Fossil-fuel-powered vehicles account for roughly a quarter of the world's energy consumption and greenhouse gas emissions. Switching to cleaner forms of transport will also significantly reduce emissions of carbon monoxide, sulfur dioxide and particulates. Sustainable transport represents a vital aspect of Sustainable Development Goal 9 – building resilient infrastructure – and Sustainable Development Goal 11 – making cities and settlements inclusive, safe and resilient.

Sustainable transportation solutions make up an important part of ABB's extensive portfolio of clean, energy-efficient technologies. We have worked particularly hard in recent years to expand our position as one of the world's leading providers of EV fast-charging stations, with more than 6,000 chargers installed in 57 countries. As just one example, ABB's charging systems are now being deployed in a growing network of stations along Germany's motorways. The company's car chargers can be found in



Case study
A reliable power supply for Warsaw's second metro line
Click here to reveal

Case study
Sustainable high-voltage circuit breakers
Click here to reveal

networks in Russia, the Netherlands, the United States, Canada, Iceland, Bulgaria and beyond. In some cases, these units can replenish an EV's batteries in as little as 10 minutes.

New, electric, high-capacity buses that use ABB's robotic flash-charging technology and onboard traction equipment have gone into service in Switzerland in the past year and are scheduled to debut in Nantes, France, in 2018. The flash-charging units are built into bus shelters and boost the vehicle's batteries in the 20 seconds or so spent at the stop. That boost makes it possible to reduce the size and weight of the bus's battery pack significantly.

ABB also provides many of the electric power supply technologies relied upon around the world for urban rapid transit systems and high-speed railway lines. One recent breakthrough in this field is the Effilight traction transformer – onboard equipment that delivers power to an electric train's motors. With a patented cell design that can reduce the amount of insulating oil required by up to 70 percent, ABB's Effilight technology also reduces the weight of a transformer by up to 20 percent and provides more energy-efficient operation – meeting two of the rail industry's top priorities.

Fuel efficiency is a major concern for maritime shipping as well, and ABB is heavily engaged in this field. Used in cruise ships and oceangoing freighters, ABB's Azipod propulsion systems consist of steerable, high-efficiency electric-drive propellers contained in pods located outside the hull. The Azipod makes ships significantly more maneuverable and can reduce their use of fossil fuels by 40 percent or more.

more than 6,000
chargers installed
in 57 countries

ABB technology, using sophisticated sensors and edge computing, also makes ships easier to monitor and maintain; the number of ship visits by ABB service engineers can be reduced in this way by as much as 70 percent. ABB Ability offers the shipping industry a wide range of decision support functions. With six dedicated ABB Ability Collaborative Operations Centers serving the marine sector around the world, shipping companies now rely on remote monitoring and diagnostics services with access to ABB experts 24/7. Today, more than 700 large vessels are connected to these services.

ABB technologies are making possible a multitude of other novel, clean transportation solutions – like solar-powered charging stations for electric rickshaws in Jabalpur, India. Seemingly small advances like these are helping cities around the world curb major sources of noise and pollution.