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ABB positioning paper

ABB: innovating for a sustainable world

Technology leader ABB will have a significant presence at the COP25 climate conference, which runs from December 2-13, 2019, in Madrid, Spain. ABB will share expertise and ideas on transitioning to a low-carbon energy system, on improving industrial efficiency and productivity, and on developing sustainable cities and transport systems.

ABB supports the Paris Agreement, which came into force in November 2016, and considers it the linchpin of efforts to limit global warming and avert the potential devastating consequences of climate change. Meeting the goals of the Paris Agreement will require significant investment in new and upgraded technologies, which will only be forthcoming with solid, reliable and predictable policymaking. As a company with around 9,000 technologists that is set to invest around \$23 billion in innovation between the signing of the Paris Agreement and 2030, ABB therefore urges policymakers to adopt sound climate policies to encourage innovation and create secure investment conditions.

ABB's contribution to climate goals

ABB contributes to climate goals by encouraging the early and rapid adoption of clean technologies and by helping its customers improve energy efficiency and productivity while extending the lifecycles of their equipment and reducing waste. Nearly 60 percent of ABB's global revenues are derived from technologies that directly address the causes of climate change by through energy efficiency, renewables integration, and resource conservation.

Among the revolutionary, energy-saving innovations to have emerged from ABB's research centers are: a high-power electric-vehicle charger that can add up to 200 kilometers of range in just eight minutes; electrically powered Azipod propulsion systems for ships, which significantly reduce fuel consumption and emissions; and the ABB Ability™ Smart Sensor, which converts almost any low-voltage electric motor into a smart, wirelessly connected device, allowing its health and performance to be continually monitored to optimize energy use, extend its lifetime, and avert unplanned service interruptions.

ABB's contributions to climate goals are widely acknowledged and were recognized in August 2018 by "Fortune" magazine, which named ABB as one of the top 10 companies that are changing the world. Beyond its own operations, ABB actively encourages and supports innovation, for instance through collaborations with leading technical institutes and universities, and by investing in and working with start-ups.

Last year, ABB joined with the Nobel organization to promote innovation, education and scientific research around the world by spotlighting the groundbreaking work of Nobel Laureates. With this partnership, the company seeks to inspire the next generation not only to value and pursue scientific discovery, but also to appreciate that science and technology can provide solutions to society's greatest challenges.

ABB is an active participant in the United Nations-driven "Sustainable Energy for All" initiative, which is working towards the Sustainable Development Goal of "affordable, reliable, sustainable and modern energy for all." The company's commitment to combatting climate change includes limiting the environmental impact of its own operations. It has set itself the target to reduce its GHG emissions by 40 percent by 2020 from a 2013 baseline. Further, ABB has committed to the Science Based Target

initiative and is working on establishing a science-based GHG emissions target for its post-2020 sustainability objectives.

Technologies for a low-carbon world

ABB technologies enable energy savings throughout the value chain, from the generation, transmission and distribution of electricity all the way to the final point of consumption. The company helps to produce clean electricity from renewable resources such as solar, wind and water, and its high-voltage direct current (HVDC) technology offers the most efficient method of transmitting electricity over long distances.

ABB's HVDC solutions can transmit renewable power thousands of kilometers from where it is produced to the populations that need it. HVDC installations are being used to connect remote wind farms to the grid and are interconnecting national grids, such as those of the United Kingdom and France, or the UK and Norway, to make it easier to transmit and sell power across borders.

ABB microgrid solutions further enable the integration of renewables into the energy mix. These small-scale electric grids 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. ABB microgrids are used for essential infrastructure – such as the global logistics center for the International Committee of the Red Cross in Nairobi, Kenya – and have been installed on a number of islands, including Jamaica, Kodiak Island in Alaska, Faial Island in the Azores, and Robben Island in South Africa. The company also uses microgrids to power some of its own facilities, such as its South Africa head office in Johannesburg.

Automating industries from natural resources to finished products

As a global leader in automation and control, ABB uses advanced technologies to improve energy efficiency and to optimize uptime, speed and yield in industries dealing with everything from natural resources to finished products. Its portfolio for industrial applications extends from energy-efficient electric motors and drives to automation and advanced robotics.

The cornerstone of this portfolio is the company's leading ABB Ability™ cross-industry offering of digital solutions and services. ABB Ability™ draws on data from ABB's global installed base of more than 70 million connected devices and 70,000 industrial control systems to generate actionable intelligence that ABB's customers can use to reduce energy consumption, improve performance and optimize their operations. ABB Ability™ delivers unprecedented levels of efficiency in all manner of industrial installations, from mines and oil & gas platforms, to power plants, to heavy industries and manufacturing and assembly plants.

ABB has long promoted the idea that upgrading ageing infrastructure is one of the most economical and practical ways to reduce energy consumption and improve energy efficiency. The largest short-term opportunity in industry is to replace inefficient electric motors with newer models that are capable of adjusting their speed according to load. If this were done with all of the 300 million motors in service today, total global energy consumption could be reduced by 10 percent – equivalent to the output of 286 nuclear reactors. In most cases, the new motors would pay for themselves within a modest timeframe through lower energy bills.

Transforming cities and transport

As urban areas are increasingly challenged to sustainably accommodate growing populations, ABB is deploying technologies to help cities reduce local air and water pollution, meet carbon reduction targets and optimize limited resources.

In 2017, ABB collaborated with Mälarenergi, a city-owned electric power and heating provider, to create smart city solutions for Västerås, Sweden. ABB Ability™ solutions were applied to the city's utilities, leveraging deep control and domain expertise to reduce water leakage and energy consumption, as well as to enhance the management of city assets.

Similar solutions can be applied to groups of buildings in other cities or to individual buildings anywhere in the world, with networks of sensors providing real-time information about heating and cooling systems, ventilation and air conditioning systems, lighting and sun-shading systems, as well as fire protection and security systems.

With buildings accounting for nearly 40 percent of global energy consumption and over one-third of GHG emissions, these solutions represent a significant short-term opportunity to conserve resources. ABB solutions for data centers substantially improve energy efficiency of these power-hungry facilities, which account for a rapidly increasing share of global power consumption.

Driving the shift to e-mobility

Like its smart building technologies, ABB's innovative offerings for railway electrification, electric-vehicle fast charging and marine applications optimize energy consumption, minimize GHG emissions, and support the shift to a low-carbon, climate-resilient economy.

In its commitment to the construction of clean and affordable electric mobility networks, ABB has become the world's leading provider of electric-vehicle fast-charging stations, with more than 13,000 fast-chargers sold in 77 countries. In parallel, ABB is developing advanced e-mobility solutions for public transport.

Among its most innovative technologies is a flash-charging system for electric buses, which recharges bus batteries in 20-second bursts at selected stops while passengers are boarding and disembarking. ABB is also pioneering "opportunity charging" solutions, which offer high power charging via an automated rooftop connection. With typical charging times of 3-6 minutes, the system can easily be integrated into existing bus networks by installing chargers at endpoints, terminals and intermediate stops.

To push the boundaries of e-mobility further and to encourage the adoption of EVs, in 2018 ABB became title partner of the ABB FIA Formula E Championship, the world's first all-electric motorsport series.

Technology leader for more than 130 years

ABB's technology leadership is built on a proven track record in innovation stretching back more than 130 years. Today, ABB is a global leader in electrification, automation, robotics, motion and power grids with seven corporate research centers around the globe. The company partners with other leading global companies, among them Microsoft, IBM, Huawei, Hewlett Packard Enterprise, Ericsson and Dassault Systèmes, to drive technological innovation and make its solutions as accessible as possible.

With 147,000 employees in more than 100 countries, ABB promotes and driving sustainability across its own and its customers' operations through its extensive portfolio of eco-efficient solutions and services.