

to clean energy research and technologies and promoting investment in energy infrastructure and clean energy technologies; and expanding infrastructure and upgrading technology for modern, sustainable energy services for all in developing countries.

Advanced engineering helps improve sustainable solutions

Sheri Straw – Duke Energy Corporation
[ABB Stakeholder Panel](#)

With respect to SDG 7's third target, SDG 7.3 – improving energy efficiency – ABB's high-efficiency motors, generators and drives are among the solutions offered by ABB with this purpose in mind. They are designed to be flexible, making it possible to optimize all processes and controls, and they are built to be reliable, so as to reduce downtime. Most of all, they are extremely efficient, offering significant reductions in power consumption. Electric motors account for roughly 28 percent of the world's electricity consumption. They are often larger than necessary and are run at full speed, even when it is not needed. Fitting every inefficient motor with an ABB variable-speed drive would result in energy savings equivalent to the output of 286 power plants. ABB offers a comprehensive range of reliable and high-efficiency motors, drives and generators for all applications.

Sustainable engineering from ABB can also be found in the high-performance turbochargers we manufacture for use in ships, power stations, generator sets, diesel locomotives and other large vehicles. ABB is a leader in the manufacture and maintenance of turbochargers for large diesel and gasoline engines. The latest

turbocharger designs can reduce exhaust gas temperatures, enable an increase in boost pressure and reduce fuel consumption.

Another technology from ABB, flexible alternating current transmission systems, or FACTS, is playing an important role in integrating renewable energy and distributed generation sources into mainstream power grids. FACTS covers a range of power-electronics-based technologies that radically increase the capacity of transmission networks – by up to 50 percent – while maintaining or improving voltage stability and grid reliability. They are vital to the development of modern smart grids and can be implemented with minimal infrastructure and environmental impacts. ABB pioneered early solutions in this field in the 1950s and continues to push the boundaries of what can be accomplished with power electronics in the field of transmission.



up to 50 percent
increase in capacity of
transmission networks

ABB Ability interacts with these solutions and many others to track and analyze operational data and then make adjustments in real time to ensure optimal energy efficiency.

Renewable energy

In addition to supporting the clean energy mandate specified by SDG 7.2 – increasing the share of renewables – ABB is committed to enabling the ideals enshrined in SDG 11, which calls for sustainable cities and communities. These goals cannot be achieved without the successful,

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widespread integration of renewable energy into our systems of transport and production.

Among ABB's many activities in the field of renewable energy, the company is one of the leading global manufacturers of solar inverters, which convert the direct current (DC) power generated by photovoltaic systems into alternating current (AC) power to be fed into the grid. ABB solar inverters draw on more than 40 years of experience and the latest advances in inverter and power converter technology. Among many other projects in 2018, ABB provided its TRIO-50 string inverters for two large solar farms in Chile, where the high average solar irradiance has made photovoltaic power plants an increasingly important part of the country's energy mix.

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 AC power into DC power for transmission, then back to AC power 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, such as cities. 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 where it is needed. HVDC is the most reliable and efficient way to ensure that renewable energy reaches consumers, and it plays an important part in a stronger, smarter and greener grid.

Another ABB solution for renewables 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, such as Kodiak Island in Alaska, where an ABB microgrid that relies heavily on wind power and flywheel energy storage has improved the community's power supply and dramatically reduced the use of fossil-fueled generators.

Among activities such as these, the company is leveraging ABB Ability on multiple fronts to ensure that renewable energy can be successfully integrated into the global energy mix on a large scale, while maintaining and even improving reliability and cost efficiency. For instance, our ABB Ability Ellipse APM (asset performance management) software ensures that the high-voltage switchgear and transformers necessary for long-distance transmission of renewable power can be counted on to serve the needs of the grid – even at times of peak demand. ABB Ability DERMS is a resource management solution for distributed energy resources. As a module of our network management platform, it aids grid operators in integrating power from sources such as rooftop solar installations and battery storage systems.

Resource conservation

In the realm of resource conservation, ABB offers a range of solutions that support SDGs 6 (clean water), 12 (responsible consumption and production), 13 (climate action), 14 (life below water) and 15 (life on land). Each of these goals calls on society to minimize waste and the dispersion of pollutants into the environment.



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