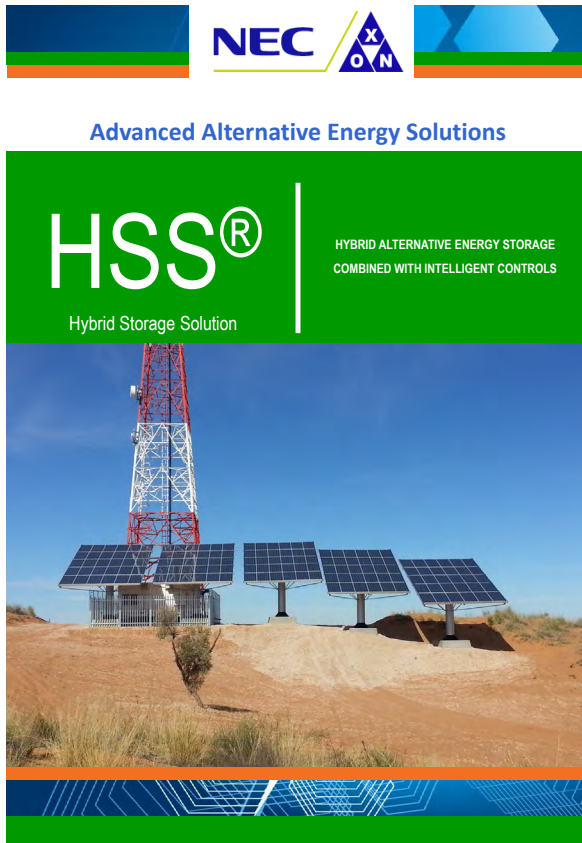


# Reducing CO<sub>2</sub> Emissions in Africa with a Hybrid Energy Storage System

## Registration with UNIDO's Sustainable Technology Promotion Platform



In the developing countries of Africa and other continents, cell phones are rapidly spreading and becoming an indispensable means of communication in daily life. With cell phones being used for internet communication that enables remittance services, remote medical services in rural areas, and education for children, providing stable mobile communication infrastructure is essential for the comfort and richness of life in developing countries.

However, since most of the base stations of mobile communications carriers are located at off-grid sites, the stable operation of communication equipment is usually realized by running generators produce electricity around the clock (24 hours 365 days). These generators run on diesel, and continuously transporting diesel from cities to rural areas—sometimes far from hundreds of kilometers—is extremely costly and labor intensive. Moreover, from an environmental viewpoint, using and transporting a petroleum-based fuel emits a great deal of CO<sub>2</sub>.

To address such social and environmental issues, NEC XON Holdings (Proprietary) Limited, an NEC Group company based in South Africa, has developed a Hybrid Energy Storage System.

Combining storage batteries, control systems, solar panels, and diesel generators, the system has IoT-enabled sensors that allow data to be collected from base stations. With reference to data on past load power usage and decades of weather data, AI-based data analysis technology is used to predict the power generation of the solar panels. These predictions are then used for suggestions on how best to combine base stations' power sources. As well as reducing the use of diesel and lowering CO<sub>2</sub> emissions, the system will facilitate the stable operation of base station communications equipment for mobile communications carriers. What is more, surplus power can be used through mini-grids by residents of nearby communities.

Our hybrid energy storage system can also be used in combination with the power grids, even in "bad grid" areas with power grids that are unstable and have frequent power outages, which is a common issue in developing countries. When power grid outages occur, the system has an automatic

control function that switches over to the storage batteries or starts up the generator if the storage batteries are empty. Also, we provide the system in an outdoor-use cabinet with an anti-theft design. The aforementioned features allow flexible rollouts of the system that cater to the particular conditions in each developing country.

For example, in a trial in Kenya the system demonstrated that it can significantly reduce CO<sub>2</sub> emissions. Compared with levels before its trial introduction, the system achieved decreases of 80% in diesel consumption and 90% in diesel generator operating time.

Since 2018, we have introduced the system to South Africa, Nigeria, Kenya, Tanzania, Ethiopia, and the Democratic Republic of Congo, and the development and usage of the system is evolving constantly to meet the needs of customers and consumers.

In 2021, the system was registered with the United Nations Industrial Development Organization (UNIDO)'s Sustainable Technology Promotion Platform and certified as a solution contributing to SDGs 8 and 9.



Our hybrid energy storage system, which has been introduced to numerous countries