

PROJECT PROFILE

Various energy applications in Kenya benefit from German remote monitoring technology

Renewable energies play an important role in the expansion of energy supply in rural regions worldwide, and the situation is no different in Kenya. In many cases, they are a fundamental driver for sustainable economic development in those areas. However, a particular challenge, especially for decentralised, remotely operated plants, is that a malfunction can cause a standstill that often lasts a long time. Digitalisation means that these plants can be operated more sustainably and their service life can be increased. The first projects in Kenya have already been put into operation.

The Karlsruhe-based startup EcoPhi Renewables Engineering GmbH (EcoPhi) developed and manufactured its own monitoring boxes and programmed a cloud platform that enables remote monitoring of the plants. The performance of complex photovoltaic (PV) systems or even water pumps can be affected by even minor problems in system operation that usually go unnoticed. For plant operators, identifying the exact source of the fault and rectifying it is often a considerable challenge. Particularly in remote regions, it takes a good deal of

work to return plants to full function in the event of a malfunction. Remote monitoring by EcoPhi enables operators to monitor the functionality of their technology around the clock and to optimise their operating results. In addition to troubleshooting, increased output, shorter maintenance times and increased system lifetimes are further enormous advantages that result from real-time data collection at a distance.



EcoPhi's exhibition booth at Solar Africa Kenya in Nairobi showcasing the company to a wide audience of specialists



Systems by EcoPhi help a rural community better monitor the PV water pump

The system by EcoPhi can be precisely adapted to the specific needs of each customer's equipment. Additional sensors can be installed enabling the monitoring system to be individually adapted for plant operators. To best provide a demonstration of the benefits, EcoPhi has used its monitoring systems in various applications as part of the Renewable Energy Solutions (RES) programme. Together with its partner Lean Energy Solutions, EcoPhi developed a boiler monitoring system for biomass boilers. Thanks to the structured digital transformation of the boiler monitoring system, the need to manually collect the data has been eliminated. This process is now automated, saving labour costs and reducing costly errors.

Furthermore, there is a remote monitoring system from EcoPhi that monitors a solar power plant for the commercial sector in Kenya's capital, Nairobi. Stability in monitoring is required in particular by more powerful plants for industrial and commercial purposes with the aim of reducing the amount of electricity that companies need to purchase from the grid. Drops in performance due to failing strings or other factors have an immediate negative economic impact through the higher costs they cause. However, without monitoring systems, these cases are only detected very late or not at all.

“Supporting the expansion of renewable energies is a central concern in terms of Germany's engagement in Kenya. With its innovative solutions, EcoPhi has contributed to making solar and water supply systems more sustainable and economical. This is an important building block.”

Alexander Fierley, Permanent Representative and
Head of the Economic Division
of the German Embassy in Nairobi

During the project, monitoring systems were installed on several water pump systems in order to ensure the fullest possible demonstration of the technology from EcoPhi in the RES programme. Water systems, especially for drinking water production, are critical infrastructure systems. Outages and power losses can therefore have a large, mostly negative impact on the local population. To avoid high losses, a monitoring and control system that can reliably monitor not only the input side (such as the solar system or the generator of a pumping station) but also the distribution infrastructure (leaks, water levels etc.) is particularly important.

The collected data from these use cases are sent via the internet or the GSM network to EcoPhi's cloud platform, where the data are collected, processed and displayed in a user-friendly way.

This means that, even if a system that needs monitoring is particularly complex, or located in a remote rural region, these factors no longer stand in the operators' way – they can retrieve current, real-time data any time and check the performance of the plant compared to desired operating results. Most importantly, these user-friendly systems are also easy to connect to existing installations – you simply plug and play.

The nascent Germany-based company has now brought these advantages to the rapidly growing Kenyan market. Together with the RES programme, EcoPhi has also carried out targeted marketing activities to incorporate their technology into various plant projects. The RES programme helps nascent startups in particular establish a good reputation, which enables them to expand their contacts and business relationships.

Company Description



The Germany-based company **EcoPhi Renewables Engineering GmbH** specialises in sustainable energy solutions and offers project planning, implementation and monitoring of installations as well as consulting and analysis of projects in the fields of solar energy and water supply.

The product portfolio includes proprietary monitoring systems and a wide range of coupled sensors as well as their monitoring platform, which provides plant operators with a deep insight into the performance of their plants at any time.

System data/system specifications

EcoPhi has installed its monitoring systems at various customers and plant types and offers comprehensive monitoring of the systems. Plant operators can measure any process control, from PV systems to water supply systems, right through to cooling systems and steam-operated high-temperature systems.

The EcoPhi platform can be used to view the plants online at any time. Dashboards provide an ideal overview for simple and, in particular, for complex or distributed installations. This proves to be particularly practical when different devices and inverters are used. In addition, the EcoPhi platform enables the integration of external data, such as those from portals of inverter manufacturers or weather databases.

In this manner, the EcoPhi system offers decisive advantages for plant operators in the Kenyan market.

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