

Small hydropower potential in Africa

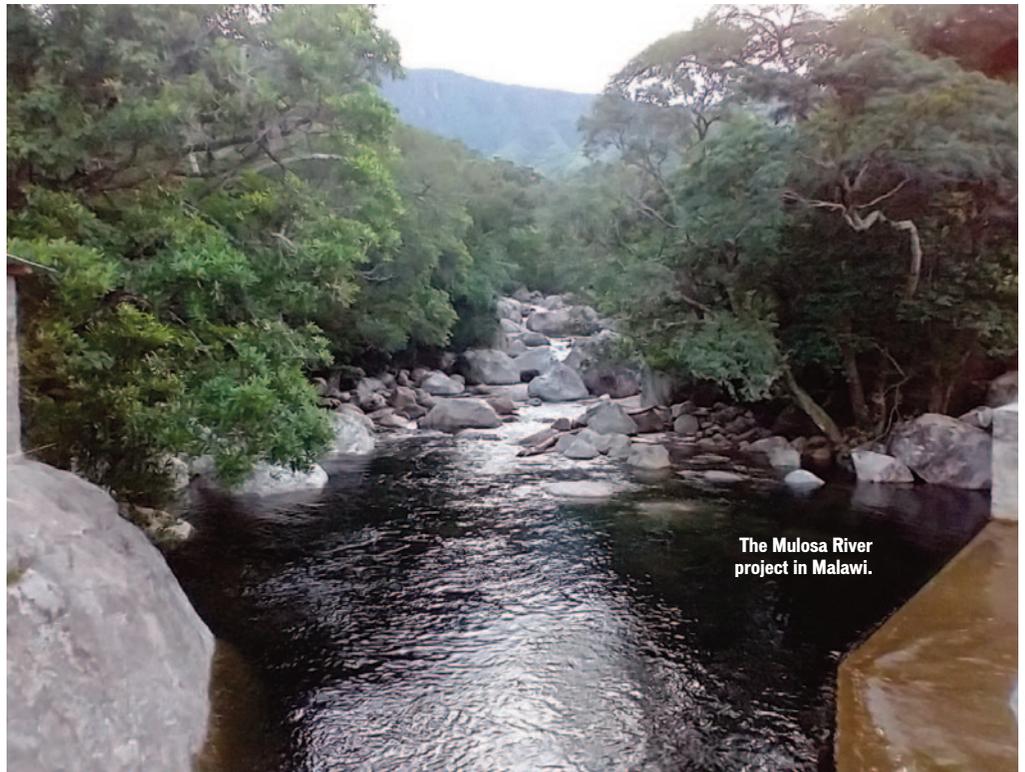
Gilkes, a leading small hydro and pump specialist, has had a special relationship with Africa, supplying small hydro turbines for tea estates and farms since the early 1900s - some of which are still in existence today.

To date, UK-based Gilkes has exported more than 460 hydro turbines to Africa, with 140MW of installed power and exported more than 6,800 hydro turbines to 85 countries worldwide.

The ongoing need for power in Africa never ceases and Gilkes is playing a crucial part to meet this. With almost 600 million Africans still lacking access to electricity, the power industry in Africa continues to have a mammoth task ahead, and the role of renewables has never been so important as an alternative sustainable source of energy to reach remote areas.

In fact, Africa is set for a renewable energy boom. According to a Rystad Energy analysis, the continent's installed capacity of renewable energy is forecast to reach 22.3GW in 2021. This is largely being driven by solar and wind projects in Egypt, Algeria, Tunisia and Ethiopia. However, hydropower is equally important and remains the main renewable resource in Africa, with more than 37GW of installed capacity, explained Andy Eaton, head of sales, Africa, Gilkes.

"Although this is dominated by larger hydro," he said "There is a place for small hydropower, which is quicker to build and has much less environmental impact due to no large dams and displacement of people. Unfortunately, the emphasis for renewable development is still focused on solar and wind, with small hydropower still being seen as the poor relation. More education is needed to support the benefits of small hydro, which is the most sustainable and renewable energy source. Small hydropower as part of a mini grid system is a sustainable energy solution for the future, supporting the development and



The Mulosa River project in Malawi.

Image Credit: Gilkes

power needs of rural communities in Africa."

The longevity of hydro equipment and sustainability of the small hydro schemes has been proven by the equipment that Gilkes has in the field and still operating for nearly 100 years. So how can the small hydro industry attract more investment?

Firstly, Eaton recommends that private investors looking for small hydro schemes need to collaborate

with developers to work out how to structure finance packages.

"To encourage more investment into small hydro projects, there needs to be realistic/sustainable feed-in tariffs," Eaton continued. "Strict timescales should be given when awarding PPAs to complete projects, and if they are not adhered to, the projects should be made available to other potential developers. Tender programmes also need looking at as they seem to

slow the market down.

"Where previously we were seeing development by public owned companies, we are now seeing an increase in development from the private sector, as well as different developments in energy recovery, mini grids and rural electrification. I see the small hydro market growing in Africa due to the growing population and therefore a need for power. From 2020 to 2050, most of the world's population growth is predicted to take place in Africa."

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ANDY EATON, HEAD OF SALES, AFRICA, GILKES

Tea estates

Historically in Africa, Gilkes' older small hydro turbines were installed as far back as the 1900s for small businesses, such as tea estates and farms in South Africa and Kenya, and in the 1970s, it saw a surprising demand for small hydro energy

recovery systems on water treatment plants in these countries.

Following a recent Unilever visit, Gilkes discovered that the tea estate schemes that were built years ago only met the power demand at the time and were not built to their full capacity. “Therefore, there is now potential to upgrade these plants and develop them to their full power potential as the power demand has grown,” he said.

Kenya’s state-run power utility, Kengen, has already approached Gilkes to advise on the refurbishment of a hydro turbine, which was installed in 1930. A project engineer was tasked with designing and modernising a new runner assembly and control system to bring the turbine into the 21st century after it had been hit by lightning. The voltage was reduced from 3.3kV to 415v and resulted in a cost saving for the switchgear and generator.

Another successful project nearing completion, is the Mulosa River project in southern Malawi. Gilkes supplied a 3.0MW Turgo

turbine and associated equipment for the powerhouse. The Turgo turbine, designed by Gilkes in 1919, is well suited to many sites in Africa with its ability to handle silty water, and is a very robust machine that needs little maintenance, with an easy operator interface.

Eaton said, “We have successfully completed the installation of [the Mulosa River project], and are on track with the commissioning. This is a great achievement as the customer put us under a tight deadline with the order being placed at the start of the pandemic.

“Our commitment from our onsite engineers is nothing short of amazing, having agreed to travel during a pandemic with the knowledge of having to self-isolate on their return. We worked closely with our customer to give our engineers confidence that all Covid precautions are in place at site and their accommodation. This commitment from our team shows a desire to overcome the most challenging of obstacles.”

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Navigating the pandemic

Gilkes has navigated its way robustly through the pandemic, with other industries being more severely impacted by the pandemic than the small hydro industry.

“At Gilkes we continue to see strong levels of enquiries for new small hydro development, particularly in Africa, where we are seeing no slow down despite the pandemic,” Eaton continued. “We are fortunate to have a good pipeline of customers and enquiries, which we continue to work with.

“As suppliers to critical infrastructure we have continued to work throughout the pandemic, meeting our customers’ expectations, with on time deliveries and uninterrupted site support. Our engineers have been able to support our customers remotely to resolve their onsite issues. While virtual events and online meetings help us stay engaged with our customers and keep up to date on the small hydro market and renewable energy sector in Africa, they cannot replace the face-to-face contact needed to build relationships, and we certainly look forward to getting back out to Africa in 2021.”

When asked what sets Gilkes apart from other similar companies, he said, “Customer relationship – we listen to the customer requirements and work in partnership with them to achieve the aims of the project. We have a long history in Africa but also a recent history. It is a place we enjoy working in, from myself visiting potential customers to our dedicated onsite engineers, who carry out the install and commissioning. Over time, we have come to understand the unique aspects of working in Africa, often in very inaccessible

locations. Gilkes has decades of experience integrating hydropower into rural mini grids and islanded applications to provide power to remote communities.”

And how does Gilkes offer peace of mind to customers?

Eaton replied, “Customers have peace of mind knowing that they have been working with a company that has been in business for more than 160 years, with a customer-focused attitude and plans to carry on supporting the small hydro industry for many, many years to come.

“Gilkes offers a full ‘concept to commissioning’ service with professional advice right from the start of the design process, as well as providing energy calculation and plant selection consultancy. We ensure consistency right the way through the project with a nominated project engineer working on the project from initial planning stages right through to on-site installation and commissioning. We also provide full training for the local site operators either at site or at our UK factory. Our equipment packages are specifically designed to minimise unscheduled downtime and our after-sales service is available throughout the life of each project. Our relationship with the customer does not finish once commissioning is completed, and we pride ourselves on supporting our customers wherever they are in the world, whether that be remotely or at site.

“Gilkes see Africa as one of our key markets, which has served us well for the last 100 years, and we are committed to seeing that partnership grow over the next 100 years.” ■

By Samantha Payne



Image Credit: Gilkes

A 3.0MW Turgo turbine has been installed in the Mulosa River project.