

MINI GRIDS FOR RURAL ELECTRIFICATION



What is a Mini Grid?

A mini grid is a localised power generation and distribution network, independent to a national grid. Typically, mini grids are developed to provide power for remote and rural communities that do not have access to a national grid. They can also be used to provide reliable power in locations where the national grid is unstable.

Mini grid systems provide communities with the opportunity to take ownership of the natural resources they have available to them, reducing their dependency on burning fossil fuels for electricity.

Run-of-river Hydro in a Mini Grid

The inclusion of small hydro within a mini grid has many advantages:

- Free fuel source
- Low environmental impact
- Mature and proven technology
- Long equipment life span (50 years+)
- Reliable source of 'mains' quality electricity
- Low maintenance
- Robust control systems requiring minimal operator interaction

Gilkes Mini Grid Systems

Gilkes design, manufacture, install and commission turnkey hydropower systems from 50kW up to 20MW. Our systems are designed to individual customer requirements, which enable us to provide the best solution possible.

Gilkes have considerable, worldwide experience of supplying turbines for mini grid networks, which has led to the development of systems that can:

- Integrate into new or existing networks
- Operate both islanded and grid connected
- Provide provision for future connection to national grids
- Have black start capability
- Respond rapidly to change in load demand
- Generate in parallel with other generators in the same network

CASE STUDY LONG BANGA, MALAYSIA

The small village of Long Banga is located in Sarawak, Malaysia close to the border with Kalimantan. Such is its remoteness that mains electricity supply is not practical. Residents generated electricity using small diesel generators run when required but the supply was not constant or reliable and relied on fuel that was transported over long distances. Long Banga was identified as an ideal location to install a Mini Hydro scheme to provide 24 hour electricity for residents. A second phase development is currently under construction to meet growing demand.

KEY STATISTICS

Turbine Type: 2 x 12" Twin Jet Turgos

Power: 320 kW

Net Head: 148m

Flow: 145 l/s



CASE STUDY IMENTI TEA FACTORY, KENYA

The Imenti Tea estate is a cooperative enterprise managed by KTDA. The Imenti Tea factory was connected to the Kenya national grid, but the supply was unstable and very prone to "brown outs" due to being on the end of a long transmission line. At these times, when the grid voltage was low, the factory had to disconnect from the grid and run on its diesel generators to avoid damage to machinery. A Gilkes Hydro scheme was installed in 2008 and the estate now has a healthy, reliable source of power.

KEY STATISTICS

Turbine Type: 475mm Francis

Power: 920kW

Net Head: 65m

Flow: 1600 l/s



CASE STUDY GRYTVIKEN, SOUTH GEORGIA

South Georgia is located in the middle of the South Atlantic some 1400 kilometres from the Falkland Islands. The island is the home of the Applied Fisheries Research Station, staffed by scientists from the British Antarctic Survey and the Museum of South Georgia. The station was powered by hydro-power up until the time it fell into disuse in the 1960s. In 2006 it was decided that a new hydroelectric generation system would be installed to provide renewable electricity for the whole island.

KEY STATISTICS

Turbine Type: 13.5" Twin Jet Turgo

Power: 250 kW

Net Head: 65m

Flow: 472 l/s



GILKES

Gilbert Gilkes & Gordon Ltd, Canal Head North, Kendal, Cumbria LA9 7BZ
Registration No.173768 England and Wales
Tel: +44 (0)1539 720028 Email: hydro@gilkes.com

www.gilkes.com