



HYBRID POWER FOR AID AND INTERNATIONAL DEVELOPMENT



www.fireflycleanenergy.co.uk

RENEWABLE POWER SOLUTIONS



Safe, Reliable and Renewable Hybrid Power anywhere in the World

We work with NGOs, charities and organisations across the world to deliver sustainable energy solutions to those who most need it. We have established good working relationships with organisations such as MSF, DfID, Solar Aid and Computer Aid, which are based on shared ethical aims and objectives.

Firefly Hybrid Power solutions are increasingly being used around the world, within 26 countries to date.

Western Europe

Firefly Headquarters are based in the UK. Ideally located for the immediate deployment of equipment to European logistics hubs and surrounding countries.

Western Africa

The full range of Firefly renewable hybrid power solutions are in use and are available through distributors across West Africa.

Central Africa

Usage of Firefly Cygnus HPGs is growing through an expanding distribution network across Central Africa.

Firefly

Firefly provides safe, clean, quickly-deployed renewable power that can be used anywhere in the world. Refugees, aid workers and communities need never be without power.

Firefly offer:

Solutions:

- ▶ Hybrid Power Generators
- ▶ Hybrid Power Tower Lights
- ▶ Stand-Alone Solar Power
- ▶ Portable Hybrid Battery Packs
- ▶ Solar Powered Spaces
- ▶ Microgrid Power Systems

Services:

- ▶ Real Time Remote Monitoring
- ▶ Field Training
- ▶ Multi-Lingual Documentation
- ▶ Telephone Technical Support
- ▶ International Shipping
- ▶ Renewable Power Consultancy

Applications:

- ▶ Disaster Response
- ▶ Stand Alone Power for Development Projects
- ▶ Permanent Microgrid Systems

Our Hybrid Power Generators:

- ▶ Reduce diesel fuel dependency
- ▶ Provide stand-alone renewable power
- ▶ Provide an uninterruptable back-up power supply

Hybrid Power Generators

For Diesel Fuel Management, UPS and/or Stand-Alone Power

Our range of Cygnus® Hybrid Power Generators (HPGs) seamlessly integrate with solar PV, wind turbines, diesel generators and a range of other renewable power generators, to provide clean, low cost power to the most remote of environments. They can operate solely from Solar PV or Wind as a stand-alone power system or, with mains grid or diesel power options (if they are available) to provide an uninterruptable power supply.

The Cygnus® Hybrid Power Generator also acts as a power management system and can link to any diesel generator to manage power.

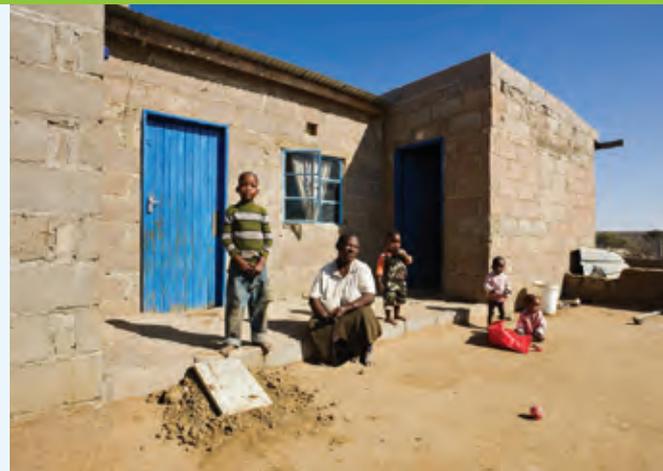
- ▶ Reduce diesel fuel consumption of generators by up to 30%
- ▶ Reduce maintenance time and costs by up to 50%
- ▶ Reduce CO2 output by 30%

Benefits

- ▶ Works with your existing diesel generators
- ▶ Temporary and permanent applications
- ▶ Immediate deployment and operational in minutes
- ▶ Provides power, regardless of fuel supply
- ▶ Low maintenance, no moving parts means no breakdown and improved energy resilience
- ▶ Lower whole life cost
- ▶ Works with all renewable energy generators
- ▶ Reduces carbon emissions

Integrate the Cygnus® Hybrid Power Generator into the core of your power supply operations.

Over 1.2 billion people - 20% of the world's population - are still without access to electricity



Firefly's renewable and efficient Hybrid Power Generators provide the ideal solution.

Flexible Usage Options:

No Access to Power

- ▶ The HPG can operate autonomously.
- ▶ The HPG can provide power from renewable resources such as solar and/or wind.

Poor / Unreliable / Limited Power - Mains Grid or Diesel Generators

- ▶ The HPG can operate as a back-up when primary power is lost. Ensuring an uninterruptable supply of power.
- ▶ The management system can calculate loadings so that the diesel generator only operates when a larger electricity load is required.
- ▶ The HPG can be programmed to provide power during certain times of the day.

Limited Supply of Diesel Fuel for Generators

- ▶ The management system can calculate loadings so that the diesel generator only operates when a larger electricity load is needed. Saving fuel for essential higher load requirements.
- ▶ The HPG can be programmed to provide power during critical times of the day.



We have worked with:



HYBRID POWER FOR DISASTER RELIEF



Power for Refugee Camps, Aid Infrastructure, Field Hospitals and Aid Worker Welfare

The logistical challenges of sourcing power for emergency response

- ▶ Power plants may be damaged or destroyed during a disaster (thus power shortages are a regular occurrence and most commonly, there is no access to power).
- ▶ Not only finding and obtaining, but delivering diesel fuel to power generators is difficult within high risk areas and very expensive.
- ▶ Power is vitally needed for the Cold Chain; refrigeration, vaccines, ice packs etc.
- ▶ Lifesaving equipment and hospitals need reliable, consistent power 24hrs a day.
- ▶ Sourcing replacement parts and maintaining diesel generators is problematic.

Firefly provide safe, clean, quickly-deployed sustainable power for disaster relief that can be used anywhere in the world. Our portable renewable energy systems, engineered to the highest standards, are suitable for field hospitals, refugee camps, site infrastructure, lighting and pumping water.

Applications

- ▶ IT and Medical Equipment
- ▶ Vaccination Medical Centres
- ▶ Satellite Phones and Internet Communications
- ▶ Cold Chain Supply
- ▶ Security and Safety Systems for refugees and aid workers
- ▶ Pumping water
- ▶ Lighting in the field

Benefits

- ▶ Portable, quick to deploy and simple setup
- ▶ Reduce or eliminate the requirements for diesel fuel – fewer logistical fuel supply issues
- ▶ Safety of staff uncompromised with no exposure to the dangers of transporting fuel
- ▶ Reduced operational costs
- ▶ Cost effective solution – allows valuable monetary funds to be used elsewhere
- ▶ Improves utilisation of logistical transport resource improved
- ▶ No moving parts – breakdowns and spare part requirements eliminated
- ▶ Autonomous running and low maintenance – free up valuable engineers time
- ▶ Enables Emergency Supply Chains to improve power planning
- ▶ Reliable, dependable power that doesn't compromise medical procedures
- ▶ Remote monitoring and asset control functionality from anywhere in the world
- ▶ Zero Carbon Emissions - Eliminates Health & Safety risks
- ▶ Silent power day and night, without vibration

Case Study: Department for International Development (DfID)

Recognising the role that renewable energy can play in delivering remote power, the UK government's Department for International Development (DfID) uses our Cygnus® 5.0kVA Hybrid Power Generators during disaster relief operations.

The Cygnus® 5.0kVA Hybrid Power Generators are being used as a stand-alone system, connected to two Solar Fold-Arrays to provide power. No fuel is required. The Cygnus® units provide refugees, aid workers and displaced communities with clean, silent power for lighting, phone charging, radios and computers. This means that essential services and communications can be maintained without relying on external suppliers, as well as eliminating noise and exhaust fumes.



MICROGRID POWER SYSTEMS

Micro-payments for micro-units of energy

- + Local entrepreneurs
- + Remote monitoring, control and payment
- = Access to affordable, grid-type energy services, anywhere.

Power for Remote and Rural Communities

Firefly sustainable Microgrid Power Systems, are suitable to provide permanent power to rural and remote communities who do not have any access to mains infrastructure. Our Microgrid system is low maintenance, engineered to an exceptionally high standard, affordable, clean and safe.

Where there is poor, limited or no access to electricity, the Microgrid provides the solution. A Microgrid can replace inefficient, expensive and polluting fuels like diesel and kerosene, whilst also providing reliable power.

The Microgrid Power Solution

Features

- ▶ Safe, clean, sustainable power
- ▶ ZERO Carbon Emissions
- ▶ ZERO Noise
- ▶ ZERO Vibration
- ▶ Low maintenance
- ▶ Power lights, refrigerators, mobile phones and other appliances

Benefits

- ▶ Stand-alone, independent sustainable power
- ▶ Suitable for rural communities with no electricity
- ▶ Resilient, proven and reliable
- ▶ Easily integrated with grid network in future if required
- ▶ Optional Wind, Battery, Solar, and Grid Modules
- ▶ Low level maintenance required

Off-Grid Power Installation Projects

We actively engage with rural communities to provide training which enables them to operate and maintain their own sustainable power systems. The system is resilient and permanent, yet engineered to be effectively and easily integrated with a main grid power network in the future. No matter where a community without electricity may be in the world, our Microgrid systems can be relied upon to deliver the power that meets their needs.

bitHarvester from access:energy

The bitHarvester platform makes the installation of a Microgrid a viable long term financial proposition. By incorporating access:energy's bitHarvester technology, Microgrid energy users can pay for the energy they use with a mobile phone. Firefly's power generation hardware with access:energy's power management and payment systems is a sustainable business model for a long-term energy supply.

To achieve universal electricity access by 2030, it is estimated that 40% of new capacity will need to be provided by Mini Grids (WEO, 2010).

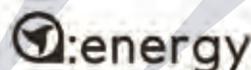
Case Study: Remba Island, Kenya

Known as Kenya's 'Slum Island,' crammed from end to end with shanty structures, Remba Island is on the Kenya-Uganda border. It is an forgotten island where infrastructure is non-existent. Remba Island's isolation means power, clean water and health services are under-developed, scarcely distributed and extremely expensive. As a result, disease prevalence is high and daily activities are a great challenge. Currently, islanders must import their energy, which is expensive and harmful to the environment, in the form of kerosene, disposable batteries and unreliable petrol generators.

Working as a technology supplier in partnership with access:energy, quality of life will improve for the islanders by using sustainable power from the wind and sun. The Microgrid power system now provides islanders with access to cheaper, cleaner, and more reliable energy.

Using access:energy's innovative bitHarvester platform, the installation is remotely controlled and monitored through cloud software and smart meters. No cash changes hands - connected customers use their mobile phones to top up pre-paid units of energy. The mobile enabled Microgrid converts the abundant sun and wind on the island into life-changing electricity to power lights, refrigerators, mobile phones and other appliances.

In partnership with:



SOLAR POWERED SPACES



Our Solar Powered Spaces are designed to be used as Internet Cafes, Community Centres, Medical Centres, Hospitals, Cold Chain Vaccination Supply and School Classrooms in rural or remote communities. With standard systems from 1kVA to 5kVA, bespoke systems can also be designed to meet the power needs of larger installations and sites, both on a permanent or temporary basis.

These unique systems are solely powered by an integral off-grid solar generator designed and built by Firefly, which operates all year round. The Solar Powered Spaces are fully insulated and can be supplied with electric lighting, heating/cooling and internet connectivity.

Features

- ▶ Stand-alone, independently powered
- ▶ Safe, clean, and sustainably powered
- ▶ Resilient, proven and reliable system
- ▶ Easy to integrate with grid network in future
- ▶ Optional Wind, Battery, Solar, and Grid Modules
- ▶ 3G WiFi networks

Benefits

- ▶ Suitable for rural communities with no electricity
- ▶ Easy setup, secure and safe
- ▶ Zero carbon emissions
- ▶ Zero noise and vibration – completely silent running
- ▶ No flammable liquids or fuels – 100% Safe
- ▶ Low level maintenance required

Solar Powered Spaces are perfect for locations lacking electricity or communication infrastructure, as they contain everything required to establish an essential central resource.

No matter where a rural community without electricity may be in the world, you can commission Firefly to build a Solar Powered Space to your specification, delivered fully equipped and ready for immediate use. Our Solar Powered Spaces are engineered to the highest standards and can be relied upon to deliver the power that meets the needs of the community. Firefly Powered Spaces are being used by numerous communities providing access to electricity. Enabling self-reliance, improving access to education, creating opportunities and reducing poverty.

Case Study: Computer Aid, ZubaBox

Computer Aid International is a UK-registered ICT for development charity, which aims to reduce poverty through practical ICT solutions. The charity collects IT equipment for distribution in hospitals, universities, schools and not-for-profit organisations in over 100 countries, for reuse in agriculture, health and education projects across UK, Africa and Latin America.

Computer Aid is passionate about the ZubaBox project. Across many rural areas in Africa and Latin America, there is no access to mains electricity and therefore innovative, sustainable and cost effective solutions are required to enable ICT access. Computer Aid International approached Firefly, with the challenge to design a solar powered internet café that can be used anywhere in the world. We created the ZubaBox - an internet connectivity solution that is mobile, solar-powered and easy to set up. Completely self-contained, it works anywhere, requiring no wired internet or external electricity supply.

With solar panels on the roof of the container, the server has software pre-installed and wiring is provided to connect the 11 flat-screen monitors within the container. Internet connectivity is provided via a cellular USB, wifi or VSAT.

The ZubaBox can be used by the entire community ranging from students, teachers, doctors as well as farmers and entrepreneurs looking to grow their businesses. Community members are provided with training, which enables them to look after and maintain their own sustainable power systems.

Currently the ZubaBox is used in Kenya, Togo, Ghana, Nigeria, Zimbabwe and Zambia, South Africa.



TRAINING AND SUPPORT

Field Training

We provide training in the field to enable operators to effectively use the hybrid power systems. Our experienced team provide in-depth training manuals in multiple languages to users during training, with support from a translator. We ensure that users are confident in managing the power supply for their requirements. A nominated individual can become trained as a 'super user', to be able to deliver training to others.

Whilst the systems have been designed to be really intuitive to use, our continuous in-the-field training is an important part of our product innovation process, as we continually collate feedback and actively progress product development. No matter where you are in the world, you can be reassured that our Hybrid Power Generators are the most advanced in their class, with the capability to meet the needs of a range of disaster and development applications.

Proven and Trusted Technology

Firefly is committed to providing dependable, emission free and silent power generation. As experts in power storage technology, our trusted and proven hybrid systems are deployed across the world to provide power in all environments and continents.

Years of development and design refinement has delivered an extremely robust power solution. Our 'hands on' experience of using the hybrid systems is essential to understanding in-the-field performance. Easy deployment, operation and low maintenance remain at the forefront of our design objectives.

Firefly Solar Communities

Community and environment are at the heart of Firefly's vision. Firefly Solar Communities is the charitable arm of Firefly Solar.

Firefly Solar Communities actively supports the work of not-for-profit organisations and charities to provide access to power to communities around the world.

We work in partnership to develop and deliver the most suitable renewable energy solution for the needs of communities in the poorest countries, in a dual effort to combat climate change and poverty.

Are you a not-for-profit organisation or charity requiring a renewable energy solution?

If so and you have a project you are planning, we would love to hear from you.

Email communities@fireflycleanenergy.co.uk for further information.

Immediate Deployment for Immediate Response

For emergency response we hold stock of Hybrid Power Systems in our UK warehouse for immediate dispatch around the world, or to your own logistics hubs.

Growing International Distributor Network

Firefly has a growing international presence including a regional office in Nairobi and a network of distributors. This means local technicians and installation partners are on hand to support your operators with training, maintenance and spare parts.

Support

Whether you are an NGO, Aid Agency, Charity or a part of an International Development Programme, you can be reassured that Firefly is committed to providing you with the support you need. All Firefly technology systems are covered under a comprehensive five year warranty for peace of mind. The systems are manufactured in the UK, under an ISO 9001:2008 approved quality control system. Component suppliers are carefully selected to ensure high levels of reliability and performance of the final product. Installation and stringent testing is carried out to ensure compliance with EU and local legislation where applicable.

"Since 2010, Computer Aid and Firefly have collaborated on a number of solar powered internet hubs called ZubaBoxes, which have been provided to the most remote areas in developing countries.

We are pleased to have a long standing partnership with Firefly who provide off-grid portable and permanent solar-powered generators, which allows ZubaBox to be an innovative, sustainable and cost effective solution to enable access to ICT for local communities. With Firefly's solar panels, they give 18 hours of electricity every day for the internet hub's 25 year life span."

Computer Aid International.





Refugees, aid workers and communities need never be without power

Safe, clean, quickly-deployed
hybrid power that can be used
anywhere in the world.

Flexible, intelligent, powerful.

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