Life Is On | Schneider Electric

Viable electricity supply alternative in New Zealand

Portable all-in-one solar battery energy system to provide an alternative electricity supply for rural communities in New Zealand

solar.schneider-electric.com

Powerco is New Zealand's largest electricity distributor, in terms of network length, and committed to delivering reliable energy to their customers. For remote and rural customers Powerco commissioned The Downs Group and Control Box to supply a portable all-in-one energy system to provide an alternative electricity supply for areas where upgrading the electricity network and improving supply is not cost effective.

Portable power supply using solar energy

Base Power by Powerco is a portable power supply for Powerco's remote and rural customers. It is a viable electricity supply alternative compared to traditional overhead lines. Featuring photovoltaic (PV) solar panels, Base Power uses sunlight to generate electricity, storing it in batteries, and is ready to power the remote household. A backup generator is included for times of low light or high load.

Homeowners reap the benefits of a reliable power supply and savings in diesel fuel, whilst the benefits for the power utility are customer retention, high customer satisfaction, and CAPEX avoidance building new infrastructure.

After extensive testing by The Downs Group and Control Box the electrical engineer on this project, Powerco's system integrators selected the Schneider Electric Conext™ XW+ Inverter Charger to power the Base Power unit. The Conext™ XW+ offers several advantages over its competitors including scalability, single or three phase operation, high power to weight ratio, high power to volume ratio, and superior peak output up to 12kW for 60 seconds.

The Downs Group and Control Box also found working with Schneider Electric easy, they were impressed with responsiveness throughout the project.

Challenges

There were several key challenges that faced Powerco from the onset. They wanted to work with a company with resources to support them during the design, development, and deployment phases.

They required the equipment to meet exact requirements such as high power output, high surge ratings, ability to work seamlessly with a backup generator, ability to monitor remotely using an open protocol such as Modbus, and most importantly the solution needed to be scalable, lightweight and a compact size.

Goal

Powerco was looking to meet their customers' needs for reliable alternative energy solution capable of operating in the harsh environments of the remote areas of New Zealand.

Customer Profile

Powerco is New Zealand's largest electricity distributor, in terms of network length, and committed to deliver reliable energy to their customers. Website: https://www.powerco.co.nz/

Solution

After extensive testing, Powerco's system integrators selected the Schneider Electric Conext™ XW+ hybrid inverter to power the Base Power unit for the product's scalability, robust design and high efficiency.

Results

Using a Schneider Electric Conext™ XW+ hybrid inverters, the customer successfully deployed Base Power that are viable, costs effective and reliable alternative energy supply to remote and rural sites by off-road vehicle or helicopter transport.

The equipment had to be compact enough to be delivered to the site by helicopter, requiring the total weight of the Base Power unit inclusive of the batteries to be less than 500kg.

Powerco also had specific requirements regarding monitoring equipment and performance at each site, a PLC was used for this purpose. To monitor the Conext™ XW+ inverter chargers an interface was written between the PLC and inverter, something that The Downs Group and Control Box achieved with little difficulty with support from Schneider Electric.

Base Power including the PV array, the Base Power unit, and the backup generator and fuel tank (From left to right)

Solution

Base Power contained three main components: the Base Power unit, the solar PV array, and the backup generator and fuel tank.

The Base Power unit measures 1850L x 1700W x 1250D. The standard configuration was composed of 3 Conext XW+8548 inverter chargers, with a rated output of 20.4kW and peak output of 36kW. Also featured were 4 Conext™ MPPT 80 600 solar charge controllers for up to 20kW solar PV, Conext™ ComBox for remote monitoring and Conext™ Automatic Generator Start (AGS) for the backup generator. The battery bank was composed of 8 lithium-ion batteries, with a total rated output of 27.2kWh as standard and upgradeable to 16 batteries with a capacity of 54.4kWh..

The standard installation programmed to supply up to 240 amps to the battery bank, although the Conext™ MPPT 80 600 charge controllers can deliver 320 amps if required. A DC Coupled scheme was used due to the compact nature of the solar charge controllers, and higher round-trip efficiency compared with AC Coupled solutions.

Base Power was designed to be expandable and could double in capacity if required. This flexibility means that Base Power can be used for moderate to heavy energy user households.

External monitoring was provided by a customized Programmable Logic Controller using a 4G connection to a central control center.

Results

Base Power proved successful for several reasons:

- Proved to be a viable, costs effective and reliable alternative energy supply to the traditional pole and wires approach
- Delivers a high surge current required for starting large motor loads
- Could be delivered to remote and rural sites by off-road vehicle or helicopter transport
- Being a portable device, it was manufactured, assembled and fully tested before being deployed to the field, saving labor and time spent at often environmentally harsh and remote sites
- A versatile product with applications including an emergency or temporary power supply, telemetry and telco applications, grid stability applications for SWER line applications, and on-grid self consumption or backup applications.

Residential Off-Grid Solution

Learn more about the Conext™ XW+ and how its complete residential solution can help you gain energy independence.

Watch our Conext™ XW+ product video.

Learn More

One Everton – A South African flagship for communal energy independence

A flexible and cost-effective battery storage solution for a high-end residential development

Providing power to an off-grid community in Kigbe, Nigeria

Going off-grid instead of living at the edge of the grid

Nigeria's blueprint for a brighter tomorrow

Singapore raises the bar for sustainable living

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