

EXTREME POWER

Sunica.plus Ni-Cd storage batteries for solar energy rural electrification in Madagascar

Many people on Earth still have no access to grid electricity. Saft and partner Schneider Electric, the global specialist in energy management, have set up a solar photovoltaic rural-electrification scheme in Madagascar providing clean, safe, renewable energy for 120 villagers.



Saft's specialised Sunica.plus batteries store solar-generated electricity for night-time use by people living in the isolated village of Marovato on Madagascar's east coast. A small step towards achieving the UN's Millennium Development Goals, and there are more steps to come.

The photovoltaic (PV) power project is part of Schneider Electric's Energy Access programme – known as BipBop, for Business, Investment, People at the Bottom of the Pyramid – that aims to create a virtuous circle combining business, technical innovation and social responsibility.

The equipment at Marovato comprises an array of 24 BP Solar photovoltaic panels with an average output of 7 kWh, a Schneider Electric Xantrex charger/inverter and a 24 V battery storage system, comprising 18 Saft Sunica.plus 920 Ah cells. When power is required in the village (mainly in the evenings), it is provided by the batteries, which are recharged by the solar array during daylight hours. The charger/inverter channels the DC electric power from the panels to the batteries and then from the batteries to the village dwellings, converting it to AC in the process.

The new power plant, which has been operational since July 2009, provides Marovato's 120 villagers with electricity for around six hours per day as an alternative to the kerosene and hand-gathered wood

traditionally used by villagers. It generates peak power of 1,400 W. In comparison, the village previously used only 490 W.

Stringent battery requirements

Why choose Sunica.plus? "Saft is a long-standing partner of Schneider Electric. They have worked with us on a variety of projects for more than 10 years", says BipBop project manager Thomas André. "Once again, they came up with the optimum solution to our needs. Stand-alone PV systems need batteries that meet stringent requirements regarding life-time, cycling, maintenance and harsh conditions." And if PV projects are to empower local people, the equipment has to be simple, robust and reliable.

Sunica.plus batteries are based on Saft's mature, proven pocket plate Ni-Cd technology. They are optimised for use in PV and wind energy applications where they perform beyond conventional limits. The robust Sunica.plus design ensures 20 years of reliable operation, even in the harshest conditions, with only minimal maintenance.

And the system is a huge success. "A couple of months after commissioning we sent an expert out to check the system and all components are working perfectly. There was only one problem", smiles Thomas André, "The villagers were so overjoyed to have access to power at last that they over-consumed at first. But it didn't take them long to realise the limits of PV systems". Spurred on by this success, Schneider Electric is already planning the next phase: a similar facility for a neighbouring and much larger village.

Millennium Development Goals

"After access to clean water, access to electricity is one of the top priorities for many people in developing economies," says Gilles Vermot Desroches, Senior Vice President, Sustainable Development at Schneider Electric. "Our BipBop programme brings together forward-thinking partners like Saft to create solutions that disadvantaged communities can take ownership of. By including not just efficient technologies, but also training, knowledge transfer and well-targeted funding, the programme provides a truly sustainable business model. I believe this project is the first step in what will be a very long and successful programme of providing the world's poor with safe, reliable, efficient, productive and green electricity."

Projects like Marovato are right in line with the UN's Millennium Development Goals. Rural electrification schemes meet several of these goals: health (fewer toxic fumes from oil lamps and candles, refrigeration for medicines), education (light to read by), women's autonomy (less time used in gathering biomass fuel) and economic development (more time to produce saleable handicrafts).

Devising a sustainable business model

"There's a huge need for this sort of solution, but future growth, as with most renewable energies, will depend on technology (higher efficiency and lower cost) and financing (development aid and government subsidies...)", explains Thomas André.

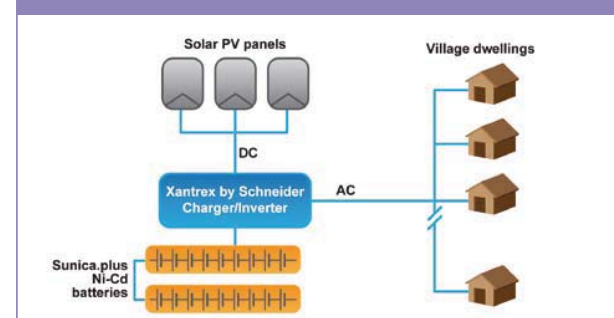
Schneider Electric's strategy here is to



apply an industrial-project approach so as to reassure institutional and international investors (providing capex) that the projects are viable over the long term and to provide a business model for local firms likely to invest in the long-term operation of the facilities.

"This is where Saft's Sunica.plus batteries come in", concludes Thomas André. "They may cost a bit more but that is clearly offset by reliability and long service life, so Total Cost of Ownership (TCO) – or cost per kWh of the power produced if you like – is much more attractive. That's what sustainable development is all about!"

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During daylight hours, the photovoltaic system charges the 18-cells SUN+ 920 battery that will power the village dwellings at night time.