

Case study

Energy storage system -
Reunion Island, Indian Ocean

A remote French island adds solar power and energy storage

Project Summary

Project: Les Cedres
Location: Reunion Island
Client: Akuo Energy
Application: Solar plant with energy storage
Load Peak Demand: 9 MWp
Technology: monocrystallin solar panels / lithium-ion batteries
GHG emission reduction per year: 9 277 tons of CO₂
Power supply per year: Equivalent to 4 697 households

Nidec ASI's role

The Power Conversion System supplied by Nidec ASI enables Akuo Energy to convert power generated by its solar panels into AC voltage for transmission to the grid. According to the standards of the French Grid, a part of the solar energy produced is converted into DC power to be stored in three batteries on hand. This energy will be injected into the grid following a flat profile of production. Energy Management System software links the PLC to predictive production according to data from weather forecasts and active power instructions received from the grid. The charging and discharging of the batteries are controlled by separate DC/DC converters, each of which is dedicated to a group of batteries with its own battery management system.



The challenge:

To generate and store renewable solar energy that can be sold on the power grid

Reunion Island, a French island with less than a million inhabitants, is located in the Indian Ocean, 120 miles from its nearest neighbor. Its isolated location and abundant supply of sunshine make it an excellent candidate for solar power generation.

Akuo Energy, a French renewable energy power producer, sought to support the island's electricity needs by generating a predictable supply of solar energy that it could store and sell to the public power distribution grid. It simultaneously wished to promote its innovative approach to aquaculture, the farming of fish and other aquatic organisms.

The solution:

Solar production and energy storage system

Among Akuo Energy's projects to increase Reunion Island's energy supply is a 9 MW photovoltaic plant, coupled with an energy storage system. The solution includes a programmable logical controller (PLC) that helps balance power generation with load requirements, dispatching the power to the grid according to power demand and quality requirements.

The solar plant includes an area dedicated to aquaculture shade structures with a capacity of 1.5 MWp. In addition to generating electricity, these structures are designed to help raise fish, providing shade, camouflage and protection. Some building are dedicated to a fish hatchery for breeding red tilapias and sturgeons. The site also includes a solar plant Agrinergy with a capacity of 7.5 MWp, dedicated to market gardening. The solution is designed to generate enough electricity to power nearly 4,700 households and lower carbon emissions by nearly 9.3 tons a year.



Christophe's dream is to see his island grow through sustainable development that protects the beauty of the land where he lives.

Nidec ASI, turning dreams into results

Nidec ASI

System components supplied by Nidec ASI

An water-cooled Power Conversion System (PCS), consisting of:

- a PCS Converter, including
 - an AC/DC converter in Active Front End configuration
 - a DC/DC converter for DC bus control
- a PCS Controller
- a Transformer

Nidec ASI realized the entire electrical system of the plant.

Power Conversion System Converter technical data		
	Grid Side (AC voltage)	Battery Side (DC voltage)
Voltage	15000 KV	<1000 VDC
Power	3,6 MW	9 MW per hour
Cooling System	water	