

The Challenge

From an economic point of view all off-grid systems with battery storage should find a way to efficiently handle their battery management. This poultry farm with renewable energy in form of wind power is no exception. The challenge was to find a way to automate the energy system so that the wind turbine does not provide more power that can be used or charged to the lithium battery bank.



Warik Energy

Why Studer

Wind turbines have high start-up inrush currents and the Studer products have the ability to cope with surges close to 3 times its rated capacity.

By using Studer's X-connect mounting system it was possible to install much power on a small surface, up to 24kVA per m2.

System components

Inverter/Chargers: 9 x STUDER XTH 8000-48

Batteries: 7 x BYD B-Box 10 cabinets providing 70kWh of storage with 140kWp charge/discharge for 5 seconds)

Other: 1 x remote control STUDER RCC-02
 1 x communication kit STUDER Xcom-LAN
 1 x STUDER Xcom-CAN
 1 x Control & monitoring system EMMA 225kW 3-phase
 1 x 7000L Copper industries buffer tank
 150kW Bonus wind turbine
 40KVA 3-phase diesel generator

The Solution

Today two large chicken sheds are powered at all times by a 72kVA system with off-grid priority combining Studer's power-electronics with Warik Energy's control and monitoring system EMMA Pro (EPRO).

Power generation on the AC-Out side is automatically regulated through the EPRO that limits the export towards the batteries to 500W per phase and directs the rest of the wind turbine produced power directly towards the sheds and diverts the excess energy into a 7000 liter buffer tank.

A clever programming between the EPRO and the Studer Xtender inverter/ charger's auxiliary relays regulates the power to the BYD batteries making sure that they never become fully charged nor empty. A level is set for the batteries highest and lowest allowed state of charge (SOC).

It is possible to view the system's performance and energy consumption remotely by using Studer's Xcom-LAN access portal. This portal also allow to download the daily, weekly and monthly logs and import them to an excel template file. The EPRO online monitoring displays the turbine generation, demand on site, export to the batteries, import from the batteries, power diverted to heating the tank, and three temperature readings from the tank allowing shut down of the turbine if the tank gets too hot in the event of a pump failing.

An interlock mechanism prevents the wind turbine and the diesel generator to run at the same time. Once the diesel generator starts a stop signal is given to the wind turbine. This is accomplished by putting a simple relay between the AC-In and the diesel generator which signals the turbine when the diesel generator is turned on.

The system has an automatic fault notification and remote access. If a fault occurs, the Xcom-LAN provides automatic notification to three different people through the Studer Access Portal which then can make the necessary changes.

Project outcome

This system, developed on a tight budget, is functioning well providing the owner almost perfect autonomy from the grid and drastically reducing grid electricity cost and dependency.

Excess power generation is used to provide heat for drying the chicken litter, reducing the need for gas heating and its associated costs.

The Company

Warik Energy, based in Dublin, Ireland, are experts in Solar PV and Energy management installations. They offer a full installation service and energy saving options through active energy management. They are certified according to the highest standards in modern building and electrical practices.

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