

# RICH HARVEST

Battery storage system with PV and diesel generator fuels agricultural revolution



## PROFILE

**Client:**  
Mandengo farm /  
farmer André Vilela Gouveia

**Business:**  
Agriculture

**Special characteristics:**  
First TESVOLT project in Brazil, largest hybrid photovoltaic installation for agricultural irrigation in Brazil

**Region, country:**  
Quirinópolis, Goiás, Brazil

## THE BACKGROUND

The state of Goiás is situated in the mid-west of Brazil. It has very fertile soils, making the region one of the country's most significant producers of cereals, pulses and oil seeds. Other important crops include sugar cane, maize and soya. The latter is the main product of farmer André Vilela Gouveia, who cultivates an area of 1,400 hectares near the small town of Quirinópolis.



## THE CHALLENGE

Although Gouveia's land is only a few metres from the Paranaíba River, until now he has only been able to use rainwater for irrigation. This is because his land doesn't have an electricity supply, so he has had no way to power an irrigation system on his fields. Because the area is in the tropical region of central Brazil, it does have a humid, rainy summer, but also a dry winter season lasting many months (May–September), during which Gouveia has, until now, been unable to grow anything.

For two years, he has therefore been trying to obtain a connection to the public utility grid for his land – without success. Gouveia was unable to reach agreement with either his neighbours or the licence holder on how the connection would be laid. Gouveia started looking around for alternatives. Typically, in areas where farming goes on beyond the reach of the utility grid, diesel generators are used. However, in addition to being very expensive to run and consuming fossil fuels, these are also – in comparison to a hybrid

solution using renewable energies – no longer economical.

Using a photovoltaic installation and a battery storage system, Gouveia can be independent from the grid and use the diesel generator less often and much more efficiently.

### Requirements for a storage solution:

- High technical reliability and resilience against failure
- High storage capacity with many guaranteed cycles for sustainable power delivery
- Straightforward installation and compatibility with photovoltaic installation and diesel generator



OFF-GRID



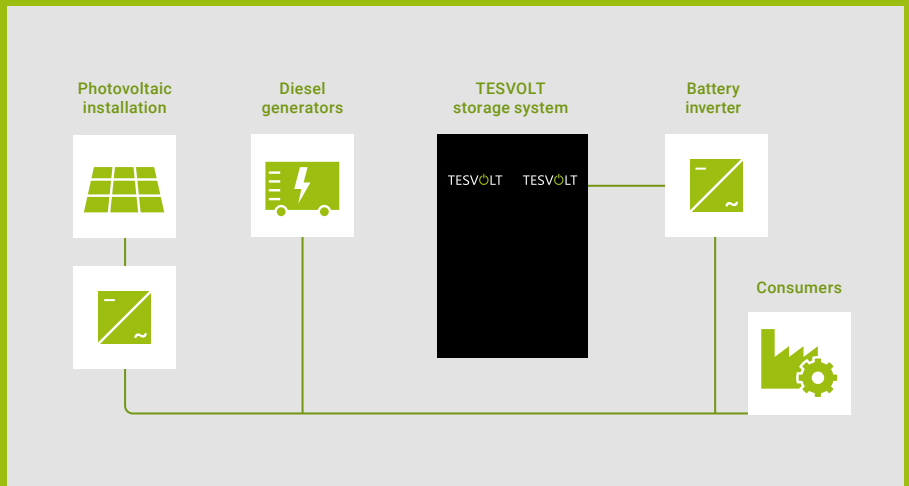
PV-DIESEL-HYBRID  
OPTIMISATION



INCREASED  
SELF-CONSUMPTION

## THE SOLUTION

Gouveia finally found what he was looking for at an agricultural fair: reliable partners who could work out the costs and install a technical solution. IDEATEK, the TESVOLT & SMA service partner in Brazil, initially installed a 773 kWp photovoltaic system. Then came the storage system – the TS HV 70 from TESVOLT. This is made in Germany, delivers a charging/discharging power of 120 kW / 150 kW and has an energy content of 307.2 kilowatt hours.



“Brazil has enormous potential for hybrid solutions in agriculture. With Tesvolt as a partner, we can guarantee our customers robust, reliable solutions and thereby improve the safety and quality of our projects.”

Bruno Furtado, Applications Engineer & Project Manager at SMA South America, former IDEATEK employee

“If I was only running the diesel generators today, I'd be burning 150 litres an hour. These days I get by with 22–23 litres an hour, and with that I can irrigate an area of 510 hectares.”

André Vilela Gouveia, farmer

## THE BENEFITS

- Increase to crop yields of 300% with the hybrid system. Possible as a result of switching to other plants such as beans, maize and soya beans
- Risk of crop failures due to dry conditions practically reduced to 0
- Decrease in electricity costs of 400% compared with obtaining licence
- Reduction in diesel consumption from approx. 150 to 23 litres per hour. Estimated reduction in consumption and CO<sub>2</sub> emissions of more than 84%
- ROI after 2–3 years
- **Safe and long-lasting**  
The system boasts an above-average lifespan of up to 30 years thanks to extremely robust Samsung SDI battery cells and the one-of-a-kind battery management system. This optimises cells not only within a single module, but also between modules within a cabinet.
- **Powerful**  
Thanks to the battery management system, TESVOLT's storage systems make the energy they accumulate fully available. TESVOLT storage systems are 1C-capable, meaning they can be fully charged or discharged in one hour with the proper configuration. As a result, even high-performance consumers can be kept running when the sun isn't providing enough power.

## PROJECT FACTS AND FIGURES

Storage system	TS HV 70
Energy	307.2 kWh
Charging/ discharging power	120 kW / 150 KW
Cell	Lithium NMC prismatic (Samsung SDI)
Efficiency (battery)	Up to 98%
Cycles	6,000 to 8,000 (0.5C to 1C at 23 °C +/-5 °C with 100% depth of discharge)
Operating temperature	-10 °C to 50 °C
Battery inverter	SMA Sunny Tripower Storage 60
Installer	IDEATEK, SMA

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