

RIPE WITH POWER

Robust battery storage system supports self-sufficient avocado farm

TESVOLT
THE ENERGY STORAGE EXPERTS



PROFILE

Client:
Torsten Ketelsen

Industry:
Agriculture

Special characteristics:
Combination of various battery technologies

Region, country:
Pemberton, Western Australia

THE BACKGROUND

About 330 km south of Perth on the southwestern tip of Australia lies a remote avocado farm owned by Torsten Ketelsen. The entrepreneur manages to produce 90 metric tonnes of the popular green fruit each year – completely independently of the public and water supply. The avocados are grown as sustainably as possible and are sold locally.



THE CHALLENGE

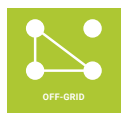
Avocados require not only a lot of sunlight but also large amounts of water to ensure they can develop the optimum flavour. On average, about 1,000 litres of water are needed to produce a kilogram of avocados, which contain more fat than any other fruit or vegetable. Since it barely rains in southwest Australia in the summer, Ketelsen operates enormous subterranean reservoirs which fill up with rainwater over the winter. High-performance hydraulic pumps are then used to bring the water to the trees in the summer.

For some years now, the farm has been using large 160 kWh sodium-ion batteries to store electrical energy generated by on site photovoltaic installation, which has a peak power capacity of 99 kilowatts. Due to the materials used, the batteries are very environmentally friendly, but they aren't powerful enough to overcome the initial power surge of the hydraulic pumps. So the farm required a different solution in order to keep running without public water supplies and a grid connection. Lithium-ion

batteries have a significantly higher energy density and can also release their power much faster than sodium-ion batteries. They also charge up much faster than sodium-ion batteries.

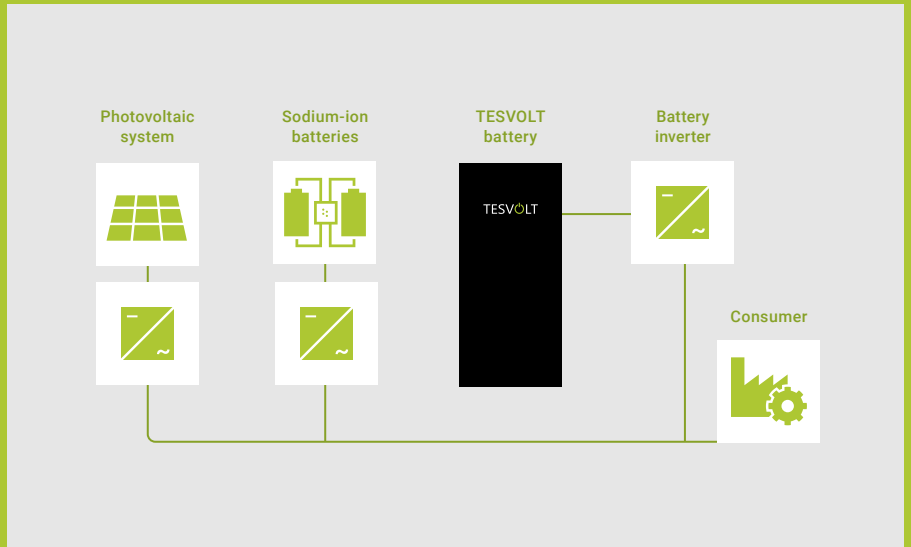
Requirements for a storage solution:

- easy installation and seamless interaction with the already installed setup
- high-performance storage system for driving the hydraulic pumps
- sustainable and durable investment



THE SOLUTION

The farm operator was looking for a high-performance storage system which could easily be integrated into the existing setup in order to absorb the hydraulic pumps' initial peak loads. After that, the smaller base load could be covered by the existing sodium-ion batteries. He found the right solution with the off-grid-ready TS 48 V lithium-ion battery storage system manufactured by the German company TESVOLT. Miller Electrics installed the model, which offers 96 kWh (2 x 48 kWh units) energy content and a charging and discharging power of 36 kW.



“It wouldn't be possible to run the installation without the TESVOLT storage system's high performance. To ensure that the water pumps can start up quickly, fast charging and discharging were essential to us.”

Mick Miller, Managing Director of Miller Electrics

“The TESVOLT storage system was wonderfully integrated into my existing setup and is now working to absorb peak loads while the sodium-ion batteries cover the base load. But in reality, the TESVOLT storage system could take care of the whole job!”

Torsten Ketelsen, owner of the farm

THE ADVANTAGES

• High-performing and fast

Thanks to the unique battery management system, TESVOLT's storage systems make energy fully available. TESVOLT storage systems are 1 C-capable, meaning they can be completely charged or discharged within an hour with the proper configuration. And the charging speed of 1C means that even high-performance electrical equipment can be kept running.

• Durable

The system boasts an above-average service life of up to 30 years thanks to robust Samsung battery cells and one of the most advanced battery management

systems on the market, which optimizes cells not only within a single module, but also between the modules in each cabinet.

• Efficient

90 % depth of discharge and only 3 W self-consumption

• Transparent

seamless monitoring of storage system health down to the cell level

• Expandable

TESVOLT systems can be expanded or exchanged at any time – not just after the first few months of operation, but even many years later.

PROJECT: FACTS AND FIGURES

Storage system	2 x TS 48 V
Energy content	96 kWh
Discharge power	36 kW
Cell	Lithium NMC prismatic (Samsung SDI)
Efficiency (battery)	up to 98 %
Cycles	6.000–8.000 (0,5C- to 1C at 23 °C +/-5 °C with 100 % depth of discharge)
Operating temperature	-10 °C to 50 °C
Battery inverter	6 x SMA Sunny Island
Installer	Miller Electrics

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