THE NET ZERO UNIVERSITY

Hybrid storage system at the heart of a large microgrid

TESVOLT
THE ENERGY STORAGE EXPERTS

PROFILE

Client:
Monash University

Industry:
Education sector

Special characteristics:
Combination of two battery technologies in a microgrid with a highly complex load situation

Region, country:
Melbourne, Australia

THE BACKGROUND

With over 70,000 students, Monash University is the largest university in Australia. It is considered one of the best institutions of higher education worldwide and its reputation attracts a great number of international students from more than 170 countries. Located in the state of Victoria, the university is divided into four large campuses with a total of 150 buildings in the Melbourne metropolitan area.

THE CHALLENGE

Monash University is known not just for its highly qualified alumni and outstanding research, but also for its ambitious involvement in social causes. With its 135-million-dollar Net Zero initiative, the university is hoping to make its own electricity consumption more sustainable. The aim is to have a completely independent power supply using solely renewable energies by 2030.

This is no small feat, seeing as the university welcomes over 40,000 visitors every day. Thousands of rooms must be air-conditioned and lit, and 120 computer centres and numerous electric vehicle charging stations must all be supplied with electricity, not to mention large-scale scientific equipment such as MRI scanners.

The first steps the university took as part of the Net Zero initiative were to maximize the energy efficiency of its lighting systems and buildings, as well as to set up photovoltaic installations with a total output of 2 MWp. But to really become efficient and self-sufficient, the system was missing a crucial element: a storage solution. For this stage, too, the university sought out its own innovative path, raising funds for a first-of-a-kind Vanadium redox flow and lithium-ion hybrid energy storage solution, which will sit at the heart of the campus microgrid.

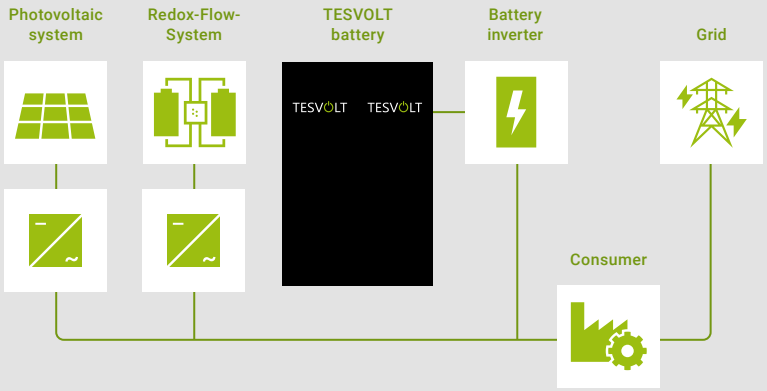
Requirements for a storage solution:

- High-performance storage system with the ability to meet the complex energy demands of a large campus.
- Easy installation and seamless interaction with the already installed setup
- Sustainable and durable investment

INCREASE SELF CONSUMPTION

THE SOLUTION

Planners at the university and at redT energy – the company carrying out the project – found their solution in Lutherstadt-Wittenberg, Germany, where energy storage company TESVOLT manufactures lithium-ion storage systems for industrial applications. Its products feature a uniquely sophisticated balancing system which ensures cell durability and optimises the reaction times for power output. The Monash project uses the TS HV 70 model with an energy content of 134.4 kWh and a discharging power of 120 kW, which is installed alongside a 900 kWh redT vanadium redox flow machine.



"The Monash University storage system is currently the largest behind-the-meter energy storage system in Australia. We are pleased to have worked with TESVOLT on this ground breaking project."

Scott McGregor, Chief Executive Officer of redT energy

"The hybrid energy storage system is a core component of the microgrid being developed as part of our Net Zero Initiative, enabling us to dispatch renewable energy more effectively across the campus and help achieve our goal of net zero emissions by 2030."

Scott Ferraro, Director of the Monash University Net Zero initiative

THE ADVANTAGES

- **High-performing and fast**
  Thanks to the unique battery management system, TESVOLT's storage systems make their energy fully available. TESVOLT storage systems are 1C-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**
  100 % depth of discharge and only 5 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	TS HV 70
Energy content	134,4 kWh
Discharge power	120 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	2 x SMA Sunny Tripower Storage 60
Installer	redT energy

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