



Photovoltaic installation on the roof at Spedition Lutter

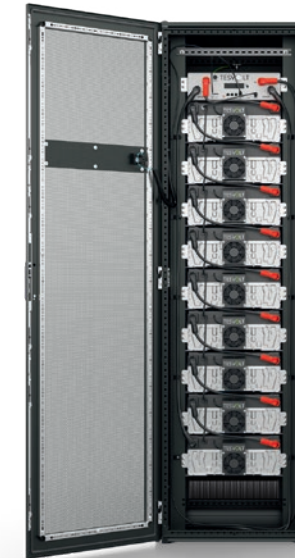
How can shipping companies become almost entirely energy self-sufficient? Photovoltaic installations with energy storage systems are one possible solution.

TESVOLT battery storage systems

NOT TIED TO THE POWER GRID

A growing number of **shipping companies** are becoming independent from the power grid, and with good reason – electricity prices are continuing to rise, while power cuts are very costly. Besides being a logical and climate-friendly solution, generating and storing their own power is also a cost-effective option. In terms of technical requirements, however, this calls for high-performance **battery storage systems** such as the ones offered by **TESVOLT** using **Rittal** enclosure technology.

Text: Vera Neuhäuser



The TESVOLT battery storage system stores solar power and provides backup power.

Thanks to solar panels and an energy storage system, Spedition Lutter in Bönen is almost entirely energy self-sufficient. Together, a photovoltaic installation on the roof with a peak output of 80 kilowatts and a battery storage system with a capacity of 50 kilowatt-hours cover practically all the energy requirements of this company, which has 52 employees and transports goods throughout Germany. The entire installation, including the battery storage system, will have paid for itself in just eight years.

ELECTRIC VEHICLES WITH CLEAN POWER

“As a shipping company, we inevitably emit a certain amount of CO₂ into the air. We wanted to change that, and we’re now gradually switching to electric vehicles,” explains Martin Gerold, who runs Spedition Lutter along with Thomas Gerold. The company currently has twelve electric fork-lift trucks and four electric cranes. Charging them from the public power grid would be expensive, as it would result in peak current loads during the charging process. Energy suppliers would have to be prepared for these and would apply correspondingly high charges.

Martin Gerold also has green plans for the future. As soon as battery technology reliably provides appropriate ranges, he intends to start replacing vehicles from his fleet of 26 diesel lorries with electric models. An on-site solar-powered recharging station will also be built at that point.

BATTERY STORAGE FOR INDEPENDENCE

The solar installation on the company building has an east-west alignment. The aim is to keep the amount of solar power generated as uniform as possible throughout the day rather than having a high yield around noon, as is the case with south-facing installations. The battery, which is installed in a VX25 enclosure system from Rittal, stores surplus solar energy from the roof. This is used to supply the site’s servers, IT systems, lorry workshop and lorry wash facility with clean power, overnight and early in the morning. If the company fed this surplus solar power



“Rittal adapted the enclosure perfectly to our needs and has been supplying us with very high-quality, robust storage system enclosures for many years.”

Simon Schandert
Co-founder and CTO of TESVOLT

into the grid, it would currently be paid just 6 cents per kilowatt-hour. Without the storage system and the solar installation, on the other hand, each kilowatt-hour would cost the company 30 cents, and this figure continues to rise.

The next step will be to make the necessary additions for the storage system to also serve as a back-up power supply solution. “We had a power cut just recently. That, too, costs an industrial company a great deal of money,” says Martin Gerold. In the future, the storage system will supply power when the public grid is down.

The lithium battery was supplied by TESVOLT, which is headquartered in the German town of Wittenberg and specialises in battery storage systems for commercial and industrial companies. TESVOLT has become a global technology leader and has already won a number of awards. Sophisticated technology makes its batteries particularly durable and cost-effective.

The energy storage system specialist considers safety to be extremely important, so it uses industry-tested VX25 enclosure technology from Rittal.

“Energy storage systems for commercial and industrial use need to meet high requirements. We therefore use only industry-proven components,” says TESVOLT’s co-founder and CTO, Simon Schandert. “Rittal adapted the enclosure perfectly to our needs and has been supplying us with very high-quality, robust storage system enclosures for many years,” he adds. ■



Optimising self-consumption



Peak shaving



Backup power

Interview with Jannik Kunzel from TESVOLT

THE ENCLOSURE FORMS PART OF OUR **SAFETY** CONCEPT

When solar and wind power is unavailable, energy storage systems ensure a stable power supply. The associated enclosure technology needs to match the stability and reliability of these systems – and also meet many more requirements. We ask **Jannik Kunzel, Product Manager at TESVOLT**, why **TESVOLT AG** has been thinking outside the box and developing joint solutions with **Rittal** for some years now.

Interview: Annedore Bose-Munde

Mr. Kunzel, why are energy storage systems growing in popularity to such an extent right now?

Essentially, energy storage systems support efficient energy management. This means self-consumption can be optimised, for example by storing power generated by photovoltaic installations during the day and then using this at night or when it's overcast. Peak shaving is a further typical application. Storage systems can step in and shave load peaks at the precise point in time when cooling systems are starting up or a large number of vehicles are being charged simultaneously. Certain countries also use time-dependent electricity tariffs, and we have introduced a time-of-use function for this scenario. The storage system charges up at times when power is inexpensive, and this power is then used during expensive periods. Storage systems make it possible to achieve zero feed-in at the grid connection point, which might avoid an expensive expansion of the grid connection.

Energy storage systems are technically challenging. What role does the enclosure play?

An important one, is the short answer. One of the first steps for us is to find an enclosure that is suitable for the battery technology. The enclosure system also needs to meet basic contact hazard protection requirements. An appropriate IP protec-

tion category is important, as is the earthing concept, of course. The enclosure system also forms part of the TESVOLT safety concept. Our systems are always certified by the TÜV inspection agency – and that includes the enclosure. Battery modules are heavy, so the enclosure also needs to be very robust.

What loads must an enclosure actually be able to withstand?

The largest system we currently use consists of 12 battery modules – each weighing 56 kilograms – and the necessary peripherals. All that adds up to around 600 to 700 kilograms. There's also the enclosure itself, which weighs about 150 kilograms. The enclosure system must have a sufficiently stable design to prevent any deformation. Given that our solutions are scalable, it must also be possible to extend the enclosures by buying them, for instance. Another important factor is ensuring straightforward handling – our modules must be easy to install.

At what stage of the development process does the enclosure enter the equation?

When we are preparing a new product concept, we consider the enclosure very early on. A specification that defines all the requirements is then drawn up. This forms the basis for the joint development and engineering process for the appropriate enclosure system. Following a num-

ber of iteration loops based on CAD data, an initial prototype is produced. The subsequent test installation of the modules and components indicates any final adjustments that may be required. The second prototype that follows this process is then normally the series prototype.

What do development partnerships mean to TESVOLT?

It's vital to tackle the joint design engineering tasks together as early on as possible. All changes made later on can become expensive. We very much appreciate it when – as with Rittal – our development partners are proactive, coming up with suggestions and ideas. We were also happy to draw on the complementary skills of Rittal, such as its thermal expertise. The TS 8 systems were the first joint project with Rittal. That was in 2016, not long after our company was founded in 2014. We regard Rittal as both a development partner and a supplier. We value its delivery reliability and also the quality Rittal ensures with its robust and durable products.

Can you give another example of a joint project?

One new development at TESVOLT is our E-Series with enclosure technology and a ventilation concept from Rittal. The new model has a higher energy density and, accordingly, a higher thermal load – all part of the challenge when designing the

“With the new TESVOLT E-Series, greater attention has been paid to climate control, so we can ensure the battery is at the ideal temperature.”

Jannik Kunzel
Product Manager at TESVOLT

enclosure. Rittal carried out simulations in advance that focused on the enclosure's temperature behaviour. The air inflow and outflow were investigated, and minimum spacing was defined to ensure external air for cooling can be drawn in. With the new E-Series, the enclosure design is now much more open. Greater attention has been paid to climate control, so we can ensure the battery is at the ideal temperature. ■

Thank you very much for talking to us.

High performance in a compact space

TESVOLT E-Series battery storage systems (on the right in the picture) feature a particularly high energy density. They are equipped with the latest generation of Samsung lithium-ion batteries. In conjunction with the Dynamix Battery Optimizer (DBO), this ensures high performance with minimal space requirements. The modules are installed in the Rittal VX25 enclosure system. A newly developed ventilation concept has also been incorporated.

