### TESVÖLT Free to go green.

## **Commercial solutions** Energy storage systems for commercial enterprises



SUNNY TRIPOWER STORAGE

# Free to go green

Sun, wind, water – nature provides us with limitless sources of energy, and we have the freedom to use them. Regardless of current weather conditions or political decisions.

As a society, we all bear responsibility for a successful energy transition – in particular large consumers such as business and industry.

TESVOLT products, innovations and ideas provide the flexibility we need to make use of renewable energies. We make them available at all times – all over the world.

We reconcile enterprise and sustainability: here and now, for future generations, for the preservation of our environment.

### Greater reliability. Greater efficiency.

# **Optimised for stringent** requirements in commercial operations

Free yourself from fluctuating electricity prices and fossil fuels. With economically reliable, efficient and climate-friendly storage systems from TESVOLT.

No more rising electricity prices - it's time for greater independence. Our energy storage systems offer safe, reliable, sustainable energy supply solutions that pay their way in demanding commercial operations in the fields of agriculture, production, logistics and trade.

Whether you want to shave peak loads, control charging stations efficiently, buy your electricity at the right time, or combine multiple applications - our storage systems offer the flexibility to meet your requirements.

We are committed to innovative "Made in Germany" technology, durable first-rate components, and maximum safety standards. Take your energy supply future into your own hands - with TESVOLT energy storage systems.



# System structure Our goal is your independence

Our TESVOLT storage systems help you ensure security of supply and independence from energy suppliers.



#### 1. Battery storage system

The TESVOLT battery storage system is the key component for integrating renewable energies within the overall system. It stores the energy generated, enables load compensation, ensures security of supply, and helps reduce costs.

#### 2. Inverter

The combination of battery storage system and inverter ensures an efficient energy supply through the flexible conversion of direct and alternating current and compensation for grid fluctuations.

#### 3. Energy management system (EMS)

The EMS optimises the energy flow and controls consumers and energy resources as well as the charging and discharging of the battery storage system, which enables a multitude of applications. Every consumer has their own individual energy requirements. All system components are tailored to these requirements and work together to ensure a sustainable and cost-efficient supply.

#### 4. Energy resources

The wide range of energy sources in the system design, such as photovoltaics or wind power, generate the required electricity, which the battery storage system stores without environmental impact.

#### 5. Utility grid

The utility grid acts as an additional back-up resource for times when renewable energy production is low. In combination with a battery storage system, it actively relieves the pressure on the public utility grid and provides a reliable supply of electricity, particularly at peak load times.

#### 6. Portal

For efficient and transparent management of the energy balance and to ensure a customised energy supply, the portal allows users to monitor energy flows, track the system status and analyse energy consumers.

#### 7. Consumers

#### Multi-use

Our wide range of applications means we can offer all of our customers solutions that are tailored to their requirements. One special feature is the multi-use capability of some of our storage systems. This allows you to use multiple operational management strategies in parallel, in various combinations, including time-dependent use. To pick just one example: you can combine self-consumption optimisation with charging station control and peak shaving. This makes maximum use of storage system capacities, combines all the advantages of the individual applications, and lets you recoup investment costs even faster.

#### Potential users

Businesses with a photovoltaic or wind power installation or a suitable area that could host an installation, such as haulage companies, agricultural operations, workshops, factories.

Other

Discover key areas of application for our storage technology in commercial enterprises.

#### Charging station control

It doesn't take long for the grid connection to reach its limits – especially when it comes to larger charging parks or upcoming expansion work on electric vehicle charging infrastructure at apartment buildings, supermarkets and commercial enterprises. This is where you stand to benefit from charging station control with the TESVOLT Energy Manager.

#### Potential users

Trade, manufacturing and industry.

#### Time of use



#### Potential users

Agricultural operations, companies and commercial enterprises, municipal facilities and industrial works.

# From the real world, for the real world **TESVOLT** projects

Our broad product portfolio offers a whole host of applications for a huge range of sectors. All our solutions prioritise high levels of economic efficiency, safety, and a long service life. An investment in a TESVOLT battery storage system often pays for itself in next to no time, and it will also protect you against rising energy prices in the long term.

#### Pumping green electricity without peak loads

Reduce peak loads for pump power and optimise self-consumption of solar power:

to achieve this objective, the Warendorf wastewater company opted for a combination of a photovoltaic installation and the new TESVOLT TPS HV 80 E storage system, which was installed in an outdoor container. The system has been in operation since early 2024 and collects information that flows into the expansion of the PV and storage system.

Storage system type: TPS HV 80 E Capacity/output: 80 kWh/50 kW Client: Warendorf wastewater company Business: Pumping station/sewage treatment plant Country: Germany

#### A shedload of power

Somerlap Forest Products in Mark, England, produces high-quality timber products and suffers from high electricity costs as well as a poor carbon footprint. Investing in a photovoltaic installation was only partly viable, as they couldn't make optimum use of the surplus solar power. Thanks to Gridimp Ltd.'s impHub software and a TESVOLT battery storage system, the company is now able to participate in energy trading while simultaneously reducing its electricity costs and carbon emissions.

Storage system type: TS HV 70 E Capacity/output: 648 kWh/180 kW **Client:** Somerlap Forest Products Ltd Business: Skilled trades, production, logistics + trade Country: United Kingdom





"This was the first storage system container that we installed. It meets our expectations 100 per cent. The project support from TESVOLT was also excellent, from project planning to delivery and commissioning on site."

Christian Schneider, Managing Director Ruiz & Schneider Elektrotechnik Recklinghausen GmbH



"As an established leader in technology, TESVOLT offered us the best battery storage system solution. We took a close look at the components of the system and the guarantees they were offering to ensure that the system meets our expectations."

Richard Ryan, Commercial Director, Gridimp

#### High performance without compromise

Our commercial storage systems are optimised for continuous use in commercial enterprises. With a maximum power rating of 1 C, they can be fully charged or discharged within just one hour, and our efficient balancing systems also ensure an efficiency of up to 98%. Top performance that you can rely on at all times.

### Impressive efficiency

A high energy density thanks to high-quality battery cells, 100% depth of discharge, and a system and performance guarantee of up to 10 years mean our storage systems are a safe investment in an independent energy future. Choose efficiency that pays off for your company and for the environment.

#### **High safety**

With prismatic battery cells from Samsung SDI, permanent monitoring of all system components, and extensive protection mechanisms, our energy storage systems meet the highest safety standards – so you can be sure that your independent energy supply is secured at all times.

#### Long lifespan

Innovative technology "Made in Germany", first-rate, high-quality components such as our prismatic Samsung SDI battery cells – and efficient balancing and control systems give our energy storage systems a lifespan of up to 30 years and 8,000 full cycles. Plan your electricity supply for the long term - just like we do.



# Storage technology Greater than the sum of its parts

The individual components and the way they interact are a key factor in the performance, lifespan and safety of a storage system. With this in mind, we exclusively use high-quality components and innovative in-house developments. This includes high-performance prismatic cells from our partner Samsung SDI, our efficient ABO or DBO control systems, inverters from SMA, and robust cabinet systems to protect against mechanical influences. All of our systems are produced in Europe's first carbon-neutral gigafactory for energy storage systems, in Lutherstadt Wittenberg. Because we believe that climate protection and the active switch to sustainable energy begin with manufacturing. And, of course, every battery module undergoes detailed inspection on our own end-of-line test track prior to delivery. Our storage systems are characterised by first-class performance, efficiency and cost-effectiveness – so you can expect reliable performance at all times without worrying about the bill.





#### a) Overcharge safety device (OSD)

Automatically interrupts the current if a cell is overloaded.

#### b) Overpressure valve

Opens in the event of overpressure at an automatic threshold.

#### c) Ceramic protective layer (SFL)

Protective layer on the anode to prevent short circuit within the cell. Ensures safety by reducing ageing mechanisms.

#### d) Safety fuse (CID)

Prevents overloading of the cell by automatically cutting off the power in the event of short circuit or overcurrent.

#### e) Nail safety device (NSD)

Protection against short circuit in the event of mechanical damage to the cell.



#### **Battery module**

Our battery modules are the heart of our storage systems. Depending on the model, a module consists of 14 or 22 battery cells connected in series. In addition, our specially developed integrated balancing system (Active Battery Optimizer/DynamiX Battery Optimizer) controls the charging and discharging of each individual cell and ensures outstanding efficiency of up to 98%.

#### Active power unit (APU)

The APU is part of our battery management system and provides built-in protection of the battery system at cell and module level. It continuously monitors for safety as well as the state of charge and the ageing of the battery cells, and enables communication with all other control components.

#### Samsung SDI cell

We exclusively use lithium-NMC cells from our partner SAMSUNG SDI, which were specifically developed for use in stationary energy storage systems. For lifespan, special safety mechanisms and energy density, these cells offer uniquely impressive performance. They also boast a recycling rate of over 90%.

100

### TS HV 50 E hybrid Two in one





Two-in-one hybrid storage solution Integrated back-up function One of Europe's safest storage systems High-performance battery cells from Samsung SDI Easy installation and commissioning

#### The right variant for all energy and power requirements

Experience the next generation of energy storage in commercial applications with our two-in-one hybrid storage solution. The hybrid inverter and integrated back-up function (< 10 ms), gives you constant security of supply even in the event of a blackout. Our new, high-performance system can also be used as a purely AC-coupled battery inverter, plus it's ideal for connecting directly to new photovoltaic installations and guarantees optimised individual dimensioning and retrofitting of your PV installation.

Our batteries, based on durable prismatic cells from Samsung SDI, guarantee maximum safety. An innovative protection mechanism monitors each cell and ensures two-pin protection at the system level. As a TÜV-certified product, the TS HV 50 E Hybrid is one of Europe's safest storage systems. Enjoy maximum efficiency and operating safety thanks to our perfectly coordinated system components.

#### Smart energy management system

With the hardware for the energy management system already installed in the hybrid inverter, you don't need a separate component. The intuitive GoodWe app ensures that you have a grip on monitoring and control at all times. Rely on tried-and-tested technology and enjoy all the benefits of an energy storage system that delivers maximum quality, reliability and durability - ideal for your individual applications.

#### **Overview of areas of application**

#### GoodWe EMS hybrid inverter:

- Self-consumption optimisation
- Physical peak shaving
- Back-up power
- Off-grid
- Load control

### **TPS HV 80 E** Compact in the container

Local container production in Wittenberg quality Made in Germany Easy installation and commissioning Minimises noise levels External location of fire loads TESVOLT Suitable for outdoor use Lower operating costs due to external attachment of inverter

#### Robust, powerful and efficient

For self-consumption optimisation, peak shaving or time of use, for forecast-based charging or for zero feed-in, the TESVOLT TS HV 80 E storage system offers a technical storage system solution to suit every application. Its advanced, cost-optimised design ensures unbeatable cost efficiency without compromising on quality and performance. Extremely robust and protected against wind and weather, it is well suited to even the toughest of tasks. High-quality battery cells from the automotive industry and innovative technologies such as the DynamiX Battery Optimizer make our TPS HV 80 E storage system one of the most durable and high-performance products on the market.

#### Sunny Island inverter and energy management system

The energy management system that comes integrated in the SUNNY TRIPOWER X inverter from our partner SMA is particularly suited to standard applications such as self-consumption optimisation or peak shaving, for example. And the Pro version with our TESVOLT EMS even meets complex requirements such as forecast-based charging, the controlling of charging stations, or multi-use functionality for combining different applications. We have the right system for you, whatever the application.

Additional project planning costs for extra charging stations.

Combination of two operational management strategies: self-consumption optimisation (SCO) with peak shaving (physical or RLM PS), SCO with time of use (ToU) or ToU with PS.







#### **Overview of areas of application**

#### Free Basic version:

- Self-consumption optimisation
- Physical peak shaving
- Zero feed-in
- Load control
- Generation control
- Charging station control\*

#### Fee-based Pro version:

- RLM peak shaving
- Multi-use\*\*
- Charging station control
- Forecast-based charging
- Time of use

### *TS HV 30-80 E*

### The new benchmark for commercial storage systems



### 1 + 6 NOC NUOU NOUN IN BORD AN USE EN ROLLIN

Greater product variety: from 32 to 80 kWh Your choice of energy management system Compact design, reduced space requirements 10-year system and performance guarantee Charging speed of up to 1C\*

\* The C-rate indicates how quickly a storage system can be charged or discharged. 1C means that a storage system can be fully charged or discharged within an hour.

#### **Overview of areas of application**

#### Free Basic version:

- · Self-consumption optimisation
- Physical peak shaving
- Zero feed-in
- Load control
- Generation control
- Charging station control\*

#### Fee-based Pro version:

- RLM peak shaving
- Multi-use\*\*
- · Charging station control
- Forecast-based charging
- Time of use
- Direct marketer interface\*\*\*

#### Suitable for every application

Whether you want to use your storage system for standard applications like self-consumption optimisation and peak shaving, controlling your charging stations, or using different applications in parallel with the multi-use function, the TS HV 30-80 E is the battery storage system for every application.

Its advanced, cost-optimised design ensures unbeatable cost efficiency without compromising on quality or performance. At the same time, the TS HV 30-80 E is extremely robust, suitable for even the toughest of tasks, and one of the most durable and high-performance products on the market.

#### Your choice of energy management

The energy management system already integrated into the SUNNY TRIPOWER X inverter from our partner SMA is particularly suited to standard applications such as self-consumption optimisation or peak shaving, for example.

And the Pro version with our TESVOLT EMS even meets complex requirements such as forecast-based charging, the controlling of charging stations or multi-use functionality for combining different applications. We have the right system for you, whatever the application.

### TS-I HV 80/100 E The great allstar with the E factor

A wide range of possible applications

Incl. integrated inverter, TESVOLT Energy Manager & myTESWORLD portal

Incl. power quality technology

100% depth of discharge

Back-up power functionality

#### **Overview of areas of application**

#### Free Basic version:

- · Self-consumption optimisation
- Physical peak shaving
- Zero feed-in
- Load control
- Generation control
- Charging station control\*

#### Fee-based Pro version:

- RLM peak shaving
- Power quality
- Multi-use
- Charging station control
- Forecast-based charging
- Semi-off-grid operation
- Time of use
- Micro-arid

- Additional project planning costs for extra charging stations.
- Combination of two operational management strategies: self-consumption optimisation (SCO) with peak shaving (physical or RLM PS), SCO with time of use (ToU) or ToU with PS.

- Additional project planning costs for extra charging stations.
- \*\* Combination of two operational management strategies: self-consumption optimisation (SCO) with peak shaving (physical or RLM PS), SCO with time of use (ToU) or ToU with PS.
- \*\*\* Project-based







Back-up power

Micro-grid



#### Versatile, economically efficient and powerful without compromise

The TS-I HV 80/100 E meets even the highest standards of performance and economic efficiency. Are you interested in dynamic peak shaving, time of use, or back-up power applications - either on-grid or off-grid? Then you're sure to be impressed with the TS-I HV 80/100 E. With output well into the megawatt range, it's equipped to handle the toughest jobs and the active filter technology means that - almost incidentally - you'll be sustainably improving the local power quality. High-quality battery cells from the automotive industry and innovative technologies such as the DynamiX Battery Optimizer make the TS-I HV 80/100 E series one of the most durable products on the market.

#### Integrated TESVOLT inverter and TESVOLT EMS

The integrated TESVOLT inverter, consisting of up to four IPU inverter modules, is perfectly tailored to the wide-ranging application areas of the TS-I HV 80/100 E. Thanks to its black start capability, it can be operated off-grid and provides back-up power in the event of a blackout. Its response time is in the millisecond range.

All energy flows can be recorded, controlled and monitored second-by-second with the TESVOLT energy management system - consisting of the TESVOLT Energy Manager and the myTESWORLD portal. With individual operational management strategies, you can combine a wide range of applications and perfectly adapt them to all requirements.

# Control and monitoring made easy Digital. Integrated. Individual.

Energy flows can be recorded, controlled and monitored with the innovative TESVOLT energy management system, which consists of the TESVOLT Energy Manager and the myTES-WORLD portal. By configuring individual operational management strategies, you can combine a wide range of applications and perfectly adapt the system to your needs.

#### The TESVOLT energy management system Comprehensive. Powerful. Efficient.

The free Basic version of the TESVOLT energy management system already covers traditional requirements such as self-consumption optimisation and straightforward charging station control. However, it is in the Pro version that the EMS really comes into its own, with special features tailored to individual needs. Enter a world of transparency and control.

All generators and consumers on the TESVOLT compatibility list can be visualised in the myTESWORLD portal via a Modbus protocol.

Numerous energy services ensure the optimisation of local energy consumption and load control (e.g. charging stations).

Absolute transparency All generators and consumers are visualised in the myTESWORLD portal and in the app. Energy data can be stored and evaluated.

Get to know the myTESWORLD portal!





#### Tailored to your needs

#### Fully digital

#### Maximum efficiency and cost-effectiveness

#### Local networking, global thinking

Our vision: all storage and generator systems are networked in a virtual combined storage power plant irrespective of location, while excess electricity is jointly marketed on the electricity exchange.

# TESVOLT services Plan your independence

Choosing the right storage system is not an easy matter. That's why we not only offer you extensive guarantees, we have also developed a series of simple tools so you can make a wide range of calculations and select the product from our portfolio that's right for you.

#### **Guarantees**

In our storage systems, safety and quality take top priority. We are committed to trusting collaboration with accredited partners, first-rate components and comprehensive performance testing. That's why we provide you with a 10-year system and performance guarantee on new storage systems.

#### **TESVOLT LCOS calculator**

It's not just the price that determines whether a storage system is worthwhile. More important is the levelised cost of storage (LCOS). This considers all the costs that arise during the lifespan of the storage system as well as the energy generated, so it represents the true price of a kilowatt hour of electricity drawn from the storage system.

Our LCOS calculator allows you to calculate these actual costs for a stored kilowatt hour of electricity based on a TS HV 80 E compared to your chosen storage system. The calculation is based on the costs for the complete storage system, consisting of the battery and battery inverter, as well as the relevant depth of discharge [DOD], the system efficiency [%], and the energy content [nominal capacity in kWh] of the storage system.





We're changing the world of energy together and shaping freedom.

For a world in which everyone can chose to use green energy.

> TESVOLT Free to go green.

# Free to go green.

TESVOLT AG is an innovation and market leader for commercial and industrial energy storage system solutions in Germany and Europe. As an agile company, it enables its customers to reduce their dependence on power companies and play an active part in the energy transition thanks to intelligent lithium storage systems.

Excellent quality, TÜV-certified safety and a wide range of capacities – from 10 kWh to 20 MWh – meet even the highest product demands.

All storage systems are series-produced in the carbon-neutral TESVOLT gigafactory in Lutherstadt Wittenberg – from where they are delivered worldwide.





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Subject to technical changes. Errors excepted. All the services described are offered in selected markets only. Ask your TESVOLT Field Service Team at any time.

This brochure is strictly informational and is not legally binding. The exact specifications and/or product features (particularly in the case of further development of the products) may differ somewhat from the information provided here. Subject to errors and changes. Please read the safety and installation instructions carefully and in full before using the product. Purchases are subject to the current guarantee policies and the general terms and conditions of delivery and business of TESVOLT AG.

You will need to register on the manufacturer's myTESWORLD portal (https://mytesworld.tesvolt.com) before you can use the TESVOLT Energy Manager energy management system (EMS). To use the Data Manager M energy management system (EMS), you will need to register on the Sunny Portal powered by ennexOS and run by the manufacturer SMA.



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