

# THE RIGHT SOLUTION FOR EVERY APPLICATION

Battery storage systems for agriculture, commerce and industry

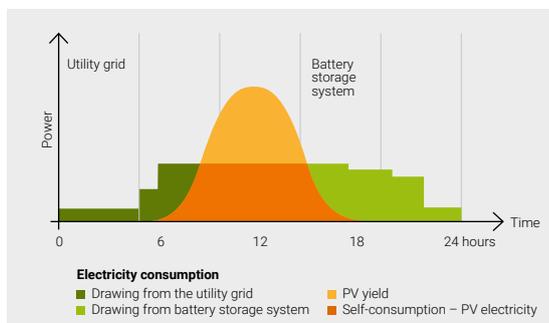


**TESVOLT**  
THE ENERGY STORAGE EXPERTS

# PAY OR DO IT YOURSELF?

Use battery storage systems to profit from the energy transition and minimise risk

The transformation of the energy market has made long-term planning security for energy costs all but impossible. Yet every change also brings opportunities. Many have already taken advantage of the energy transition to tap into an attractive business with secure revenue streams with photovoltaic installations, biogas generation and wind power. Now battery storage systems offer the next big opportunity: secure yourself against uncertainties while earning money, and avoid the consequences of potential power outages with back-up power.

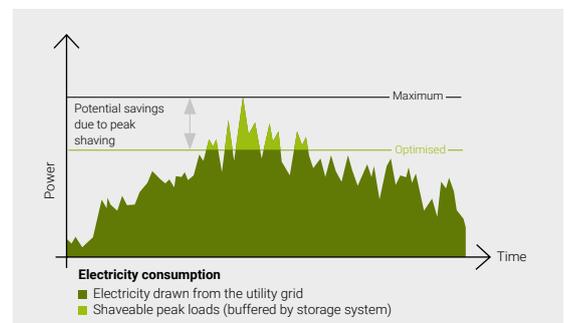


## SELF-CONSUMPTION OPTIMISATION

If the solar yield is greater than the current electricity consumption, the excess is fed into the battery storage system. If the solar yield dips below power requirements, the storage system kicks in and delivers the needed electricity. When it runs out, electricity is drawn from the utility grid. In this way, the self-consumption share can be boosted to 80% or more.

### Potential users

Operations with a photovoltaic installation or a suitable roof, such as carriers, agriculture, workshops, factories



## PHYSICAL PEAK SHAVING

Consumers with load profile measurement primarily pay for the utilised power. Costs are based on the moments when power consumption is the highest, i.e. the peak loads. Battery storage systems can provide stored electricity during peak loads and reduce utility grid consumption. This reduces the connected load and can save thousands of euros per year.

### Potential users

Operations with high power consumption and load profile measurement, such as quick charging stations, agriculture, workshops, manufacturing



Multi-use

### MULTI-USE APPLICATIONS

Multi-use allows you to combine operational management strategies, such as self-consumption optimisation (SCO), peak shaving (physical or dynamic) and Time of Use (ToU). A storage area can be defined for each of the selected applications depending on specific requirements. For maximum service life and economic efficiency.



Charging station control

### THINK PEAK PERFORMANCE, NOT PEAK LOADS

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

**Potential users**  
Trade, manufacturing, industry



Back-up power

### INEXPENSIVE BACK-UP POWER

Battery storage systems help ensure a reliable power supply. You can also optimise or completely replace a diesel generator with a battery storage system. In case of a power outage, your battery storage system takes over the power supply and your operation keeps running without interruption.

**Potential users**  
Operations that depend on a reliable power supply, such as livestock farming, cold stores



Off-grid

### RELIABLE POWER SUPPLY WITHOUT THE UTILITY GRID

You need electricity but there's no grid connection available? In conjunction with a power source such as a photovoltaic installation and/or a CHP, battery storage systems enable the creation of an off-grid system. Battery storage systems can also optimise the consumption of diesel generators.

**Potential users**  
Properties that need electricity but lack a grid connection

# DIVERSE BUSINESS MODELS

## Further potential applications with TESVOLT storage systems

Depending on the inverter used, such as the integrated TS-I HV series inverter, the SMA Sunny Tripower TS HV series storage, or the low-voltage SMA Sunny Island, TESVOLT battery storage systems are suited to a wealth of potential applications and business models.

No matter what your industry or commercial sector – TESVOLT is always the right choice.



Load control

### SYNCHRONISATION FOR BUSINESS OPTIMISATION

If your own energy production is low and the battery storage system is empty, loads that are not urgently needed are simply switched off, including the charging station for the electric car, which only has to be ready for use again in eight hours. Actively switching loads on and off brings production and consumption into sync and optimises the economic efficiency of entire systems.

#### Potential users

Operators of larger battery storage systems with a grid connection



Generation control

### FOR GREATER INDEPENDENCE FROM ENERGY SOURCES

Actively switching generation systems on and off optimises the economic efficiency of entire systems. This effect is compounded through additional control options for generators, such as combined heat and power plants.

#### Potential users

Operators of entire systems with a grid connection and generation systems



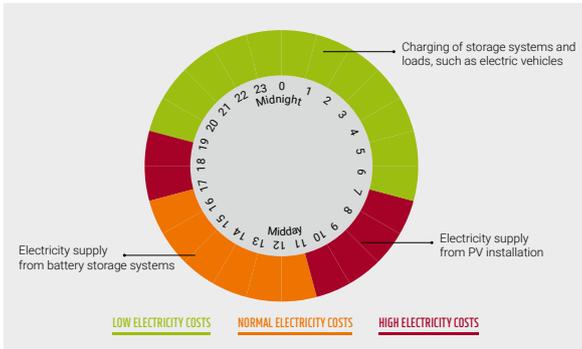
Power quality

### PROTECT EXPENSIVE PLANTS AND MACHINERY

During the operation of production facilities, the mains voltage experiences fluctuations that can also affect the public utility grid. Poor power quality impairs machines, data lines and other plant components and, in the worst case, leads to defects. Adverse consequences could be economic (downtimes, maintenance costs) or legal (manufacturer guarantees, insurance) in nature.

#### Potential users

Operations that depend on a reliable power supply, such as livestock farming, cold stores



Time of Use

## CUT COSTS WITH TIME OF USE APPLICATIONS

For electricity customers who are subject to variable pricing, off-peak tariff consumption might make economic sense, but it is not always an option. TESVOLT storage systems can significantly cut consumption at peak tariff times, saving plenty of money, with the side benefit that it also evens out and stabilises the load on the public utility grid.

### Potential users

Operations with variable pricing from grid suppliers, the public sector, ancillary service providers

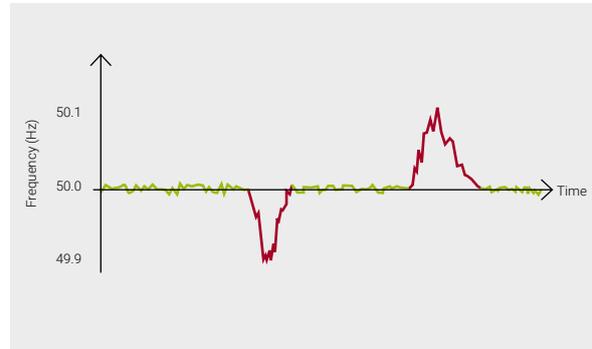


Dynamic peak shaving

## DYNAMIC PEAK SHAVING

With physical peak shaving (PPS), every consumption peak that occurs is simply covered by electricity from the battery storage system, while the system involved in registering load profile measurement (DPS) works at 15-minute intervals to ensure greater accuracy and therefore also enhanced efficiency.

The consumption peak maximum that the supplier tolerates is circumvented, because the amount of electricity consumed is registered over a period of 15 minutes to permit short peak loads. The TESVOLT Energy Manager only kicks in when the average consumption threatens to exceed the maximum tolerated peak value within the 15-minute interval.



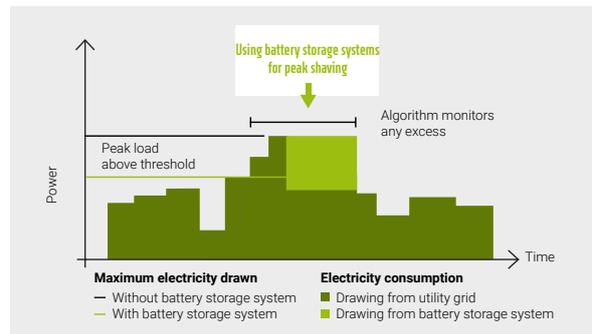
Ancillary services

## EARN MONEY WITH ANCILLARY SERVICES

To keep the utility grid working at its best, the amount of electricity generated must equal the amount of electricity consumed. This has to happen for each and every second of the day and night. If more energy is fed in than is needed at a given time, or if demand exceeds supply, load fluctuations occur and cause power failures. Grid operators are in a constant balancing act to manage this with system demand control.

### Potential users

Operators of larger battery storage systems with a grid connection



### Background:

Where annual consumption exceeds 100,000 kWh, the energy supplier charges a kilowatt-hour rate and a demand rate. The kilowatt-hour rate is calculated for each kWh, while the demand rate is calculated based on the maximum average power level (in kW) within 15-minute intervals. If the average power level exceeds the maximum amount within a single interval, the consumer then has to pay a higher demand rate. Depending on the billing period, this charge can be incurred for up to one year.

# THE TESVOLT

# ENERGY MANAGEMENT SYSTEM

Control and monitoring made easy

All energy flows can be recorded, monitored and controlled using our innovative TESVOLT energy management system – consisting of the TESVOLT Energy Manager and the myTESWORLD portal. By setting individual operational management strategies, you can combine a wide variety of applications and thus perfectly adapt the system to the needs of commerce and industry.

Test  
the demo  
version now!

## FUNCTIONS OF THE myTESWORLD PORTAL

The **myTESWORLD portal** offers a wide range of functions for monitoring and controlling energy flows. This is available in both a free Basic version and a fee-based Pro version – corresponding to the associated areas of use, with expanded functionality.

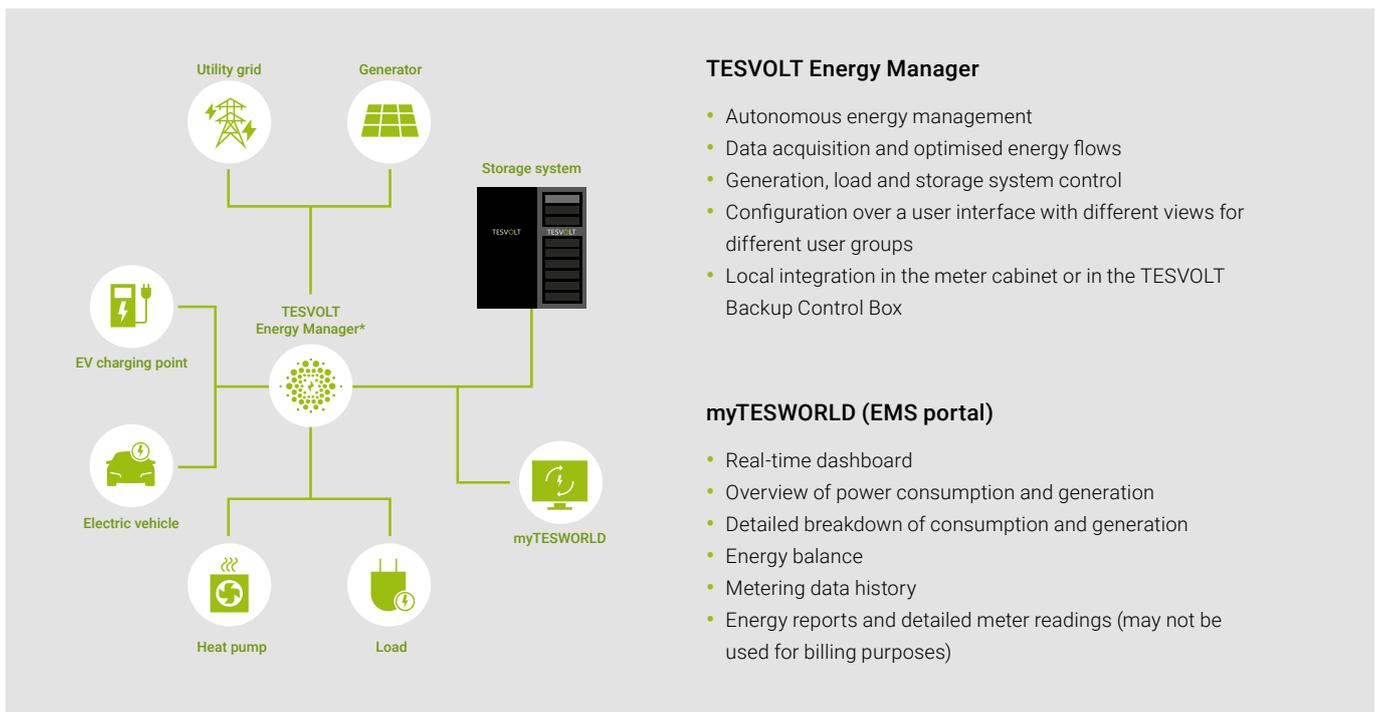
- Real-time dashboard
- Overview of power consumption and generation
- Detailed breakdown of consumption and generation
- Energy balance
- Metering data history
- Energy reports and detailed meter readings (may not be used for billing purposes)

Would you like to get to know **myTESWORLD** better? Then simply sign up for test access and get an overview of all of our portal's functions at your leisure. We'd naturally be delighted to help you if you have any questions.

### IT'S SO SIMPLE:

Go to <https://mytesworld.tesvolt.com>, click on "Sign up" and register with your email address. You will receive an email with a confirmation link so you can log in. Once you're logged in, you can get an idea of the benefits of myTESWORLD with the "Start the DEMO" button.

Registration in the manufacturer's myTESWORLD portal [<https://mytesworld.tesvolt.com>] is required to use the energy management system (EMS) TESVOLT Energy Manager.



This graphic shows an example of a system structure. See the installation manual for more detailed information.

\* The TESVOLT Energy Manager is currently only available in combination with the TS-I HV 80 and the TS-I HV 80/100 E. Products with SMA inverters use the ennexOS energy management system.



# WHAT CHARACTERISES

# A GOOD STORAGE SYSTEM?

## **RAPID DISCHARGE (1C)**

Essential for high power levels. If the C-rate is too low, the storage system has to be very large to provide the required power. This ultimately makes the storage system unnecessarily expensive.

## **HIGH EFFICIENCY AND LOW STAND-BY LOSSES**

Some energy is "lost" in each storage process. The storage system efficiency indicates how much of the energy in the storage system can be taken out of it. This value should be well over 90%, while stand-by losses should be no greater than 5 watts.

## **HIGHEST SAFETY STANDARDS**

For storage systems, make sure the battery is monitored at cell level, as this is the only way to detect the need for maintenance at an early stage. The battery cells should also come from a reputable source. Established manufacturers offer cells that will not ignite even if damaged.

## **INTELLIGENT BATTERY MANAGEMENT**

Monitoring each individual battery cell is essential to guaranteeing maximum performance, safety and durability. This ensures that all cells are optimally charged and discharged at all times and that potential errors are detected in good time.

## **HIGH CYCLE STABILITY AND LIFESPAN**

Battery storage systems are subjected to wear with each charge cycle. There is therefore a specified number of full charge cycles for a storage system before it goes below a certain residual capacity. There is also a lifespan in calendar years that specifies the maximum lifetime in years.

# WHAT DOES THAT MEAN, EXACTLY?

## DoD

Depth of discharge – indicates a storage system’s maximum discharge depth. Many storage systems cannot be fully discharged, which means that not all of the energy in the storage system is available for use. Good storage systems have a depth of discharge of 100%.

## Full cycle

A full cycle is a single instance of complete charging and discharging of a storage system. In practice, this involves totalling partial charges and discharges. One of the ways the lifespan of a storage system is specified is with a number of full cycles.

## C-rate

This 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. A storage system with 0.5C requires two hours for the same, while for 2C it takes just half an hour.

## LCOS

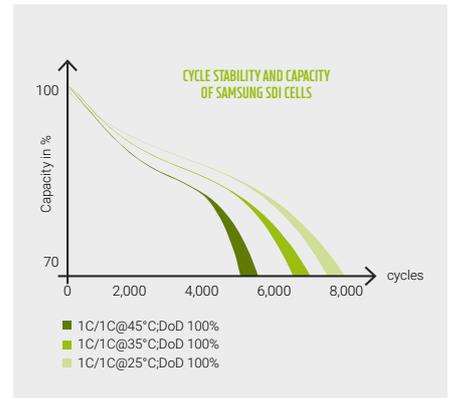
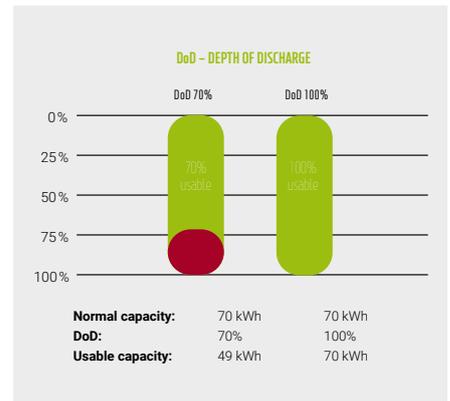
Levelised cost of storage – describes the cost for a kilowatt hour of energy charged into a battery storage system and drawn back out of it. The lifespan and number of cycles, the maximum depth of discharge and the system efficiency are the determining factors here.

## Li-NMC

Lithium-nickel-manganese-cobalt-oxide – abbreviated as Li-NMC, is a cell chemistry characterised by high energy density, high performance and long lifespan.

## SoH

State of health indicates the health of the battery as well as the percentage of the initial battery capacity that is still usable in the current charging cycle. How fast the battery ages depends in part on the quality of the battery, as well as the balancing process used.



### PASSIVE BALANCING

Efficiency: 0%, balancing current: 0.05 A  
High losses



### UNIDIRECTIONAL BALANCING

Efficiency: 70–90%, balancing current: 3.0 A  
Moderate losses



### ACTIVE BALANCING

Efficiency: > 90%, balancing current: 5.0 A  
Low losses

## HOW DOES BALANCING WORK?

Cells age at different rates. These differences between the cells have a negative impact on the battery’s charging and discharging behaviour. Cell balancing attempts to minimise these differences as much as possible. In passive balancing, all cells are brought to the level of the weakest cell by having the stronger ones burn off energy. In contrast, the **DynamiX Battery Optimizer** from TESVOLT uses the heated energy for active fan operation to increase the efficiency of the entire system and the rate of **balancing currents**. In unidirectional balancing, stronger cells charge any weaker subsequent cells. The **Active Battery Optimizer** uses active balancing between all battery cells within the battery module and even between the different battery modules.



# POWER MEETS PERFORMANCE

The right solution for every situation

Whether you're looking for that extra bit of energy and economy, or focusing on high-performance balancing and longevity – the two TESVOLT product ranges (E series and A series) offer solutions designed to meet the highest standards and overcome every challenge.

## WHAT MAKES TESVOLT STORAGE SYSTEMS DIFFERENT?

An outstanding battery storage system is more than the sum of its parts. That's why we specialise in developing innovative systems that are precisely tailored to the requirements encountered in industry and commerce, with a variety of impressive application options.

With all our products, safety, reliability and economic efficiency, not to mention a first-class installation service, take priority. We guarantee this not just by using high-quality components – such as Samsung SDI high-performance prismatic cells – but also through our unique battery control systems.

The TESVOLT **Active Battery Optimizer (ABO)** and the TESVOLT **DynamiX Battery Optimizer (DBO)** monitor and control cells' charging and discharging processes. Combine them with the **Active Power Unit (APU)** and our **battery monitoring solution (BatMon)** to experience truly high-performance, transparent battery management.

TESVOLT's E series, pared down for economic efficiency, is just as compelling as the performance-focused A series. But whether you opt for the E series or the A series, the outstanding quality and performance of our storage systems are sure to impress you.



### A SERIES AND E SERIES: A COMPARISON



	14S module A series	22S module E series
 Energy density	156 Wh/l	211 Wh/l
 Depth of discharge (DoD)	100%	100%
 Expected cycles	up to 8,000	up to 8,000
 C-rate:	up to 1C	up to 1C
 Energy	4.8 kWh	8.0 kWh
 Battery efficiency	> 98%	> 98%
 Battery management	ABO	DBO

# THE TESVOLT E SERIES

Our storage systems with extra energy



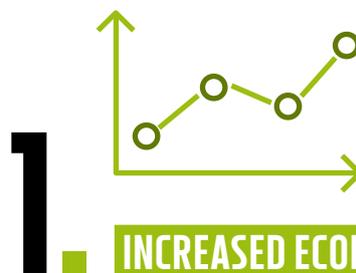
## PERFORMANCE MEETS ECONOMIC EFFICIENCY

The storage systems in our new E series\* offer maximum power with excellent value for money.

This is all thanks to the use of the latest-generation Samsung SDI lithium-ion cells in combination with our DynamiX Battery Optimizer (DBO).

With 35% higher energy density per module and efficient cell balancing including active cooling, this system offers low investment costs, reduced operating costs and therefore an optimum LCOS.

\* Please refer to our website for current availability



## INCREASED ECONOMIC EFFICIENCY

Reduced costs per kWh by using the latest generation of modules with increased energy density and optimised, dynamic balancing



Reduced investment costs mean low cost per kilowatt hour of stored energy



### 3.

#### REDUCED SPACE REQUIREMENTS

35% higher energy density per module offers greater performance in the same space

### 4.

#### "PLUG AND PLAY" SOLUTION

Easy installation and commissioning thanks to auto-configuration and latest-generation, mechanically coded DC plug-in connectors (that only plug in one way)



### 5.

#### HIGH SAFETY

Multi-layer protection of each individual cell and functional safety at system level

# MAXIMUM ECONOMIC EFFICIENCY

# IN THE SMALLEST OF SPACES

The E series with extra energy

## Basic functions



Generation control during utility grid operation



Load control



Self-consumption optimisation



Off-grid



Physical peak shaving



Back-up power



Charging station control



Zero feed-in

## Pro functions: fee-based use



Time of Use



Micro-grid



Charging station control\*



Multi-use



Dynamic peak shaving



Power quality



Semi-off-grid operation



Forecast-based charging

\* for more than one



## TS-I HV 80 E/TS-I HV 100 E

## THE ALLSTAR WITH THE E FACTOR

The TS-I HV E series satisfies the highest performance and economic efficiency standards.

Are you interested in dynamic peak shaving, Time of Use or back-up power applications, either on-grid or off-grid? Then our TS-I HV E products are sure to impress you. With performance well into the megawatt hour range, they're equipped to handle the toughest jobs and, thanks to the active filter technology, they also improve the local power quality – sustainably and almost incidentally. High-quality battery cells from the automotive industry and innovative technologies such as the Dynamix Battery Optimizer make the TS-I HV E series one of the most durable products on the market.

### Technical data

**System size:** 80 kWh to the megawatt-hour range

**Inverter:** TESVOLT PCS-85

Registration in the manufacturer's myTESWORLD portal [<https://mytesworld.tesvolt.com>] is required to use the energy management system (EMS) TESVOLT Energy Manager.

## TPS-E – THE ALL-ROUNDER WITH THE E FACTOR

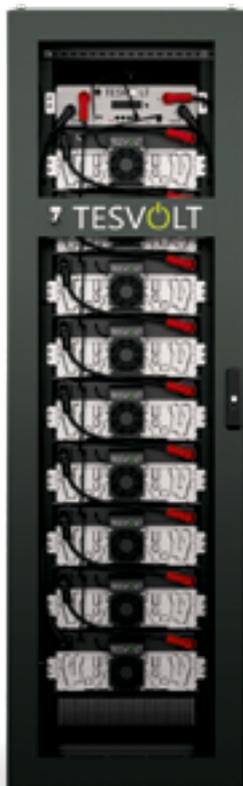
Available in the container sizes 20, 40 and 45 ft, the TESVOLT TPS-E can be used at up to 1,300 V DC, and is both black start-capable and highly reliable. It is extremely efficient thanks to the DynamiX Battery Optimizer and new Samsung 22 S battery modules. The smart operational management and innovative Eco Cooling system help cut operating costs. Special service bonus: option of remote maintenance and monitoring at cell level, prepared for AI error diagnosis. As a pure storage container, the TPS-E is always supplied without an inverter.

### Technical data

**System size:** From 80 kWh to the megawatt-hour range  
**Inverter:** E.g. SMA Sunny Central Storage (500–3,000 kVA)



All applications of the TPS-E are project-based and dependent on the connected inverter.



\* Only in conjunction with the SMA app

## TS HV 70 E – THE POWERHOUSE WITH THE E FACTOR

The TS HV 70 E offers maximum performance in minimal space. Tailored to maximum performance, it offers impressively high efficiency and optimum value for money. For commercial, agricultural or industrial usage, the TS HV 70 E offers professional users investment security with a low LCOS.

### Technical data

**System size:** 72 kWh to the megawatt-hour range  
**Inverter:** SMA Sunny Tripower Storage 60 (60/75 kVA)

# THE TESVOLT A SERIES

Our long-lasting, modular storage systems meet the highest standards.



## OUR STORAGE SYSTEMS MEET THE HIGHEST STANDARDS

Long-life, high-performance, modular. With outstanding quality, a long lifespan and expandability, the A series storage systems meet the highest standards for commercial or industrial usage.

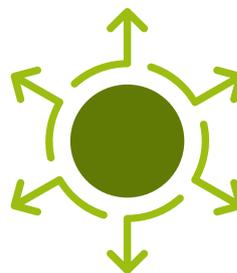
By using our Active Battery Optimizer, you can ensure cell-friendly balancing, a theoretical lifespan of up to 30 years with almost no loss of efficiency – which can reach 98% – with easy retrofitting of individual battery modules whenever you need more power.

Discover long-lasting performance that is flexible enough to adapt to your needs.



## 1. MAXIMUM LIFESPAN

The Active Battery Optimizer (ABO) ensures optimum, cell-friendly charging and discharging of each cell to enable a theoretical lifespan of up to 30 years



## 2. MODULAR EXPANSION OPTIONS

As demand grows, individual modules can be easily retrofitted with no loss of efficiency, even years later



### 3. **MAXIMUM SAFETY**

Multi-layer protection of each individual cell and functional safety at system level



### 4. **MAXIMUM EFFICIENCY**

Economic efficiency thanks to a longer lifespan and higher cycle stability of the modules



### 5. **LOW SELF-CONSUMPTION**

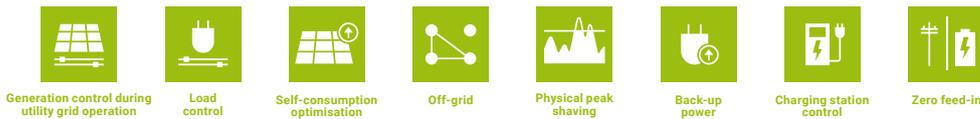
Low self-consumption in stand-by operation of just 5W

# OUTSTANDING PERFORMANCE

# AND A MAXIMUM LIFESPAN

The A series – A plus for performance

## Basic functions



## Pro functions: fee-based use

\* for more than one



## TS-I HV 80 – THE ALLSTAR

The TS-I HV 80 is our first battery storage system with an integrated TESVOLT inverter and the innovative TESVOLT Energy Manager energy management system.

Back-up power, self-consumption optimisation, peak shaving, load and generation control, off-grid use and much more besides – thanks to its versatility, the TESVOLT TS-I HV 80 is the ideal energy storage solution for virtually every application. With its multi-use capability, it can also simultaneously be used for self-consumption optimisation and for peak shaving. And of course, the TS-I HV 80 also boasts all the advantages of our other products: high-end battery cells from the automotive industry, innovative technologies such as the Active Battery Optimizer, flexible retrofittability and a lifespan of up to 30 years.

### Technical data

**System size:** From 76 kWh to the megawatt-hour range  
**Inverter:** TESVOLT PCS-85

Registration in the manufacturer's myTESWORLD portal [<https://mytesworld.tesvolt.com>] is required to use the energy management system (EMS) TESVOLT Energy Manager.



-   
Self-consumption optimisation
-   
Physical peak shaving
-   
Multi-use
-   
Time of Use
-   
Generation control
-   
Grid system services
-   
Forecast-based charging\*
-   
PV-diesel-hybrid optimisation
-   
Direct marketer interface

\* Only in conjunction with the SMA app

## TS HV 70 – THE POWERHOUSE

The TS HV 70 is a high-voltage lithium battery storage system for installation in enclosed spaces. It is available with an energy content of 67–304 kWh per battery inverter. Up to 14 inverters can be operated in a configuration. Thanks to its high-voltage technology, the TS HV 70 is one of the most economically efficient systems on the market.

TS HV 70 storage systems can be connected to the grid and used to optimise the consumption of diesel generators.

### Technical data

- System size:** From 67 kWh to the megawatt-hour range
- Inverter:** SMA Sunny Tripower Storage 60 (60/75 kVA)



-   
Back-up power
-   
Self-consumption optimisation
-   
Charging station control\*
-   
Micro-grid
-   
Grid system services
-   
Off-grid
-   
PV-diesel-hybrid optimisation
-   
Generation control
-   
Zero feed-in\*
-   
Forecast-based charging\*
-   
Load control\*
-   
Time of Use\*
-   
Direct marketer interface\*\*

## TS 48 V – THE FLEXIBLE ONE

The TS 48 V is a flexible lithium battery storage system for installation in enclosed spaces. It is available in three different rack sizes, and the energy content can be selected in increments of 4.8 kWh up to a maximum of 48 kWh.

TESVOLT TS 48 V storage systems can be used off-grid or linked to the grid and can be connected in single-, three- or split-phase setups.

### Technical data

- System size:** From 4.8 kWh to the megawatt-hour range
- Inverter:** SMA Sunny Island 4.4 M/6.0 H/8.0 H (3.3/4.6/6 kVA)

\* Only in conjunction with the Home Manager 2.0  
\*\* Only in conjunction with the Data Manager

# CONTAINER-SIZED POWER

## TESVOLT technology on a large scale

Whether in the heat of the desert or permafrost zones, utility grid-connected or off-grid: the TPS flex and TPS-E are extremely robust. Designed as flexible, reliable energy storage systems for use in harsh environmental conditions around the world and for almost any purpose. And, of course, they offer all the advantages of a TESVOLT storage system.



### **Our battery storage systems can be optimally adapted to suit every application.**

Whether it's used to optimise self-consumption or shave peak loads, connected to the utility grid or used off-grid to optimise diesel hybrid systems, used in the desert or the Arctic Circle, the TESVOLT TPS-E from TESVOLT is a technical storage system solution to suit every application. Its advanced, cost-optimised design ensures unbeatable cost efficiency without compromising on quality and performance. It is extremely robust and well suited to the hardest of tasks. High-quality battery cells from the automotive industry and innovative technologies such as the **DynamiX Battery Optimizer** make the TESVOLT TPS-E storage system one of the most durable products on the market.

### **ECO COOLING SYSTEM**

- Keeps noise at a sustainably low level
- Cuts operating costs

### **DYNAMIX BATTERY OPTIMIZER**

- Brand-new, dynamic balancing system
- No dead times – balancing takes place at the same time as storage system charging and discharging
- Greater efficiency and lower operating costs than comparable systems

### **OTHER BENEFITS**

- Can be used up to a rated voltage of 1,300 V DC
- Black start-capable
- 100% DoD
- High level of resilience against failure of master/slave systems
- Greater economic efficiency thanks to higher energy density by area
- Remote maintenance possible
- Three different container sizes available (20, 40 or 45 ft)

# OUR CONTAINERS ON THE JOB

## SUSTAINABLE AND COST-EFFECTIVE PRODUCTION OF BIOGAS USING A BATTERY STORAGE SYSTEM

The Wenning family's farm has been producing biogas on the outskirts of Rhede for 42 years. The biomethane plant can produce 600 standard cubic metres of biomethane per hour. It runs 24 hours a day, seven days a week – an enormous throughput which also causes extremely high power consumption. Agitators, pumps and the gas processing operations consume between 500,000 and 600,000 kWh per year.

To cushion the costs, the family opted for a PV installation and a TPS flex energy storage system. This gives them up to 90–95% self-sufficiency in energy consumption and also saves 600 tonnes of CO<sub>2</sub> per year.

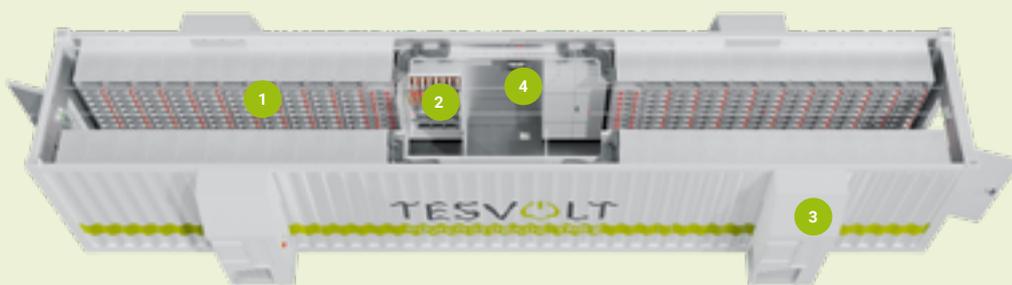
**Wenning Biogas GmbH & Co. KG**

**Storage system:** TPS flex

**Capacity/output:** 576 kWh/240 kW

**Business:** Energy sector, agriculture

**Location:** Rhede (NRW), Germany



- 1 Battery racks
- 2 DC combiner
- 3 Compact air conditioning unit
- 4 Fire alarm control panel

The TPS-E storage system has a fully modular design from the battery modules to the container for flexible adaptation and high efficiency thanks to its long lifespan.

\*The graphics shown may differ from the actual structure.

# THEORY IS GOOD, PRACTICE IS BETTER.

A selection of TESVOLT's on-grid projects

## GREEN ELECTRICITY FOR THE STREETS

There are over 600,000 electric vehicles registered on the streets of Germany. Around 235,000 vehicles pass the Kreuz Hilden junction between the A3 and A46 motorways every day. So expanding the charging stations in this metropolitan hub to include electric vehicles was the natural next step. Here, a charging park spanning a total of 12,000 square metres is coming together – one of Europe's largest. All 114 charging points are supplied with almost 100% green electricity, in part generated by a 400 kWp photovoltaic installation on the charging park's carports. To allow storage of the generated power, Volt-go GmbH opted for the TESVOLT TPS flex container system as a storage system with a total capacity of two megawatt hours.

Quick charging for electric vehicles causes high electrical peak loads, which are "intercepted" by the powerful battery storage system. This means that electrical peak loads are then generated by the discharging battery, instead of the grid. The storage system thus saves charging station operator Roland Schüren from running up additional costs.

### Ladepark Kreuz-Hilden GmbH

**Storage system:** TPS flex

**Capacity/output:** 2 MWh/2 MW

**Business:** Electric charging infrastructure

**Location:** Kreuz Hilden motorway junction,  
North Rhine-Westphalia, Germany



»With the TESVOLT system, our electricity peaks are well below what they used to be, which brings us huge savings.«

Volker Küchler, Director of the Oberjoch Familux resort



## LUXURY HOTEL

The Familux resort consumes over 1 GWh of electricity per year. Only the TS HV 70 was managed to reduce the expensive peak loads. In addition, the hotel has reached an agreement with its energy supplier for its atypical grid usage. This sees the hotel minimising its grid load with a storage system within a time window, while it is exempt from metering for the rest of the day.

### **Oberjoch Familux resort**

**Storage system:** TS HV 70

**Capacity/output:** 307.2 kWh/300 kW

**Business:** Tourism, hospitality

**Location:** Oberjoch (Allgäu), Germany



## PROTECTING CRITICAL INFRASTRUCTURE

Located in Tettau, Brandenburg's largest waterworks supplies 25,000 households. Thanks to the TS-I HV 80, it is Germany's first waterworks equipped for off-grid operation. Together with the 1,200 kWp photovoltaic installation, the storage system can start the works from black and synchronise it with the grid.

### **Tettau waterworks**

**Storage system:** TS-I HV 80

**Capacity/output:** 921 kWh/900 kW

**Business:** Infrastructure

**Location:** Lausitz, Germany



»With the charging station, I am showing that climate protection is not just an environmental necessity but also financially worthwhile.«

Roland Schüren, operator of the charging park and organic master baker

»The Hilden charging park was, in many respects, a remarkable project for everyone involved. Communication with TESVOLT was exemplary at all times and at eye level.«

Andrea Klimek, project manager and partner, Rheinland Solar GmbH



## THE NEW STABLE FAVOURITE

Pig farm Hof Borchers specialises in piglet breeding and sow fattening. Modern pig farming is fully automated, and much of the equipment with ventilation has to run overnight. The TS HV 70 uses cheaper electricity from the photovoltaic installation rather than drawing expensive power from the grid.

### **Hof Borchers**

**Storage system:** TS HV 70

**Capacity/output:** 76 kWh/75 kW

**Business:** Agriculture

**Location:** Borken (NRW), Germany

# FULL OF ENERGY,

# EVEN WITHOUT THE UTILITY GRID

TESVOLT enables off-grid solutions for energy independence worldwide



## RICH HARVEST

Although his land is only a few metres from the Paranaíba River, without a grid connection André Gouveias could only use rainwater for irrigation. With a TS HV 70 combined with a diesel generator and PV installation, he can irrigate his fields, sharply increasing his crop yield by 300%.

### Mandengo Farm

**Storage system:** TS HV 70

**Capacity/output:** 307.2 kWh/150 kW

**Business:** Agriculture

**Location:** Goias, Brazil



## POWER UP YOUR BACK-UP

The Wurm family runs a petrol station in southern Bavaria. Electricity is produced on the roof by a PV installation and in the basement by a CHP. A TS 48 V stores the electricity for their own consumption and supplies back-up power in the event of a power failure. They can use this to start up the diesel pumps, which means the petrol station can serve as an emergency petrol station.

### Eberhardzell chicken farm

**Storage system:** TS 48 V

**Capacity/output:** 40 kWh/18 kW

**Business:** Fuel trade

**Location:** Traunstein (Upper Bavaria), Germany





»For our project in Mali, we needed a reliable supplier for high-performance energy storage. Just like us, TESVOLT believes in a decentralised, green, reliable energy supply.«

Torsten Schreiber,  
Founder and CEO of Africa GreenTec

## SOLAR CONTAINER IN MALI – ELECTRICITY FOR 250,000 PEOPLE

In collaboration with Africa GreenTec, TESVOLT supplies lithium storage systems for mobile solar containers with a total capacity of several megawatt hours (MWh), enabling reliable electricity supply for several dozen villages in Mali.

The 40-foot containers, each with a photovoltaic installation of up to 65 kWp and a 60-kWh battery storage system, supply electricity for EUR 0.20 per kilowatt hour (kWh). Previously, the villagers were paying up to EUR 1.50 per kWh of electricity, which was produced by costly diesel generators – or they simply had no electricity at all. TESVOLT storage systems are used worldwide, even in challenging environments, and have a long lifespan thanks to the company's very own Active Battery Optimizer.

### Africa GreenTec

**Storage system:** TS 48 V

**Capacity/output:** 60 kWh/18 kW per Solartainer

**Location:** Mali, Africa



## ABOUT TESVOLT

Daniel Hannemann and Simon Schandert established TESVOLT in the summer of 2014 with a vision to bring affordable, clean energy to every corner of the world. Their aim was to develop and manufacture battery systems that store power from renewable energy sources as efficiently as possible. Given that the biggest energy consumers in many countries are commerce and industry, the company focused on storage systems with a large capacity from the very beginning. Today, TESVOLT produces its solutions for commercial storage systems in series and supplies them all around the world.



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