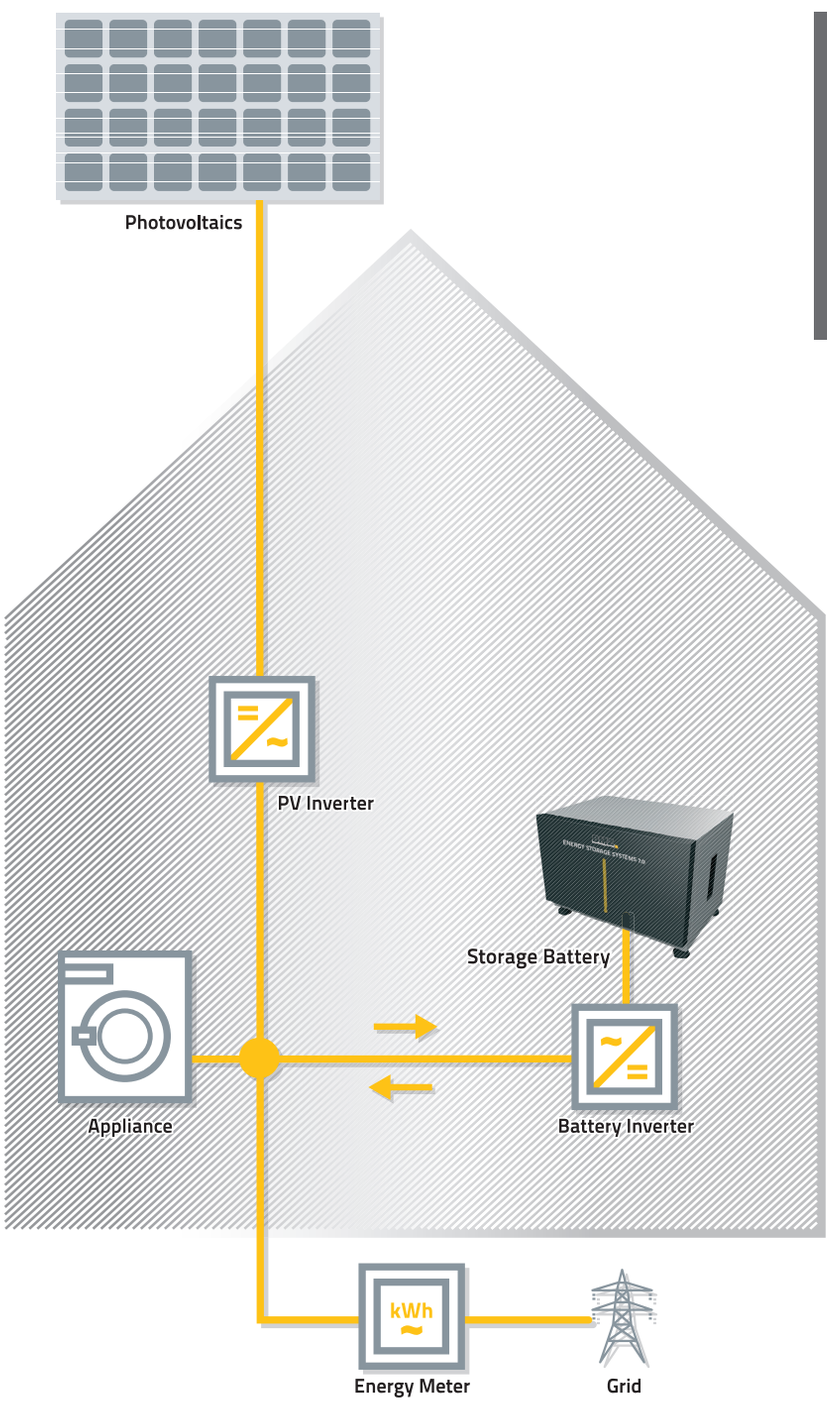
BMZ
ENERGY STORAGE SYSTEMS

MAXIMUM PERFORMANCE FOR YOUR INDEPENDENCE

LITHIUM-ION TECHNOLOGY +

BMZ ENERGY STORAGE SYSTEMS TAKE YOU ON THE BRIGHT SIDE

Our highly innovative energy storage systems (ESS) make solar power users independent of energy prices and able to use solar energy they collect at the time they need it. Our intelligent, modular lithium-ion energy storage units save the photovoltaic energy you collect so it is at your disposal during night time or when there is low solar radiation. While the sun is shining an inverter allows you to choose between charging up your storage unit or enables your solar power to be fed into the power grid.



YOUR BENEFITS:

- Reducing energy costs
- Lifetime up to 20 years
- Environmental technology
- Emergency power supply in case of power outage

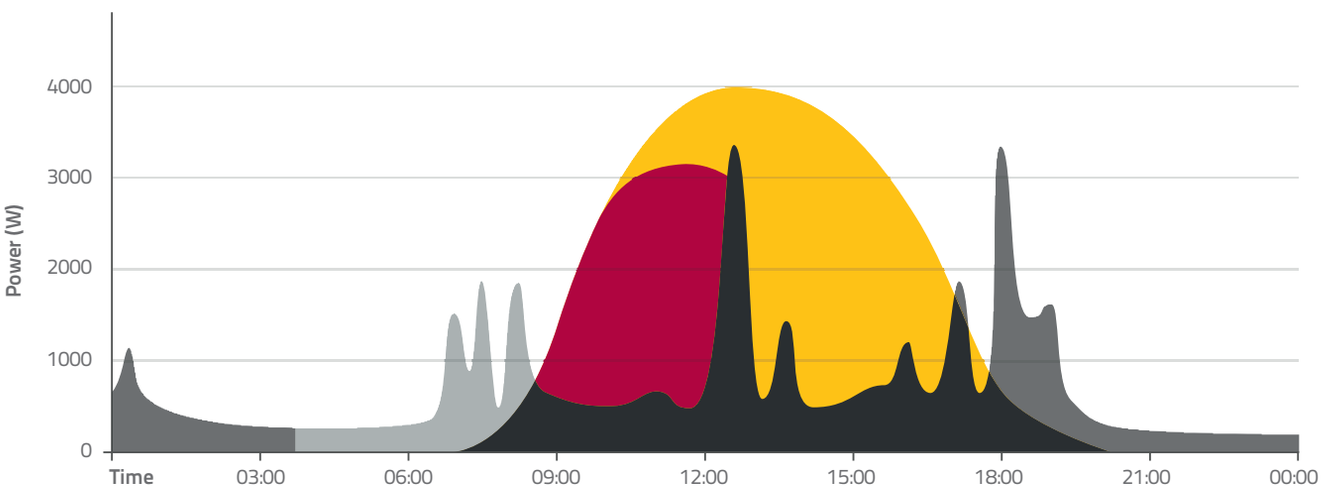
TECHNOLOGY PARTNERS

Chose your technology partner

REDUCE YOUR ENERGY COSTS SMARTLY

BMZ's ESS enables you to become more independent from your electric power supplier since you can use your own electricity 24 hours a day. You can reduce your electricity bill by using solar power stored in your ESS instead of drawing power from the grid. The next time your electric company raises the energy price you can relax.

DAY PROFILE OF SELF CONSUMPTION AND PV-GENERATION WITH PHOTOVOLTAICS



Natural self-consumption	Photovoltaic plants with an Energy Storage System of BMZ supply as first the current loads.
Storage	Excess solar power will be stored in BMZ Energy Storage System
Self-consumption via an storage unit	and if it's necessary it will be later used
PV-generation	If the BMZ storage unit is full, excess solar power will be feed into the grid
Purchase of electricity	In case that the power of Photovoltaic plant and the battery storage does not cover the current energy consumption, energy from public grid must be obtained.

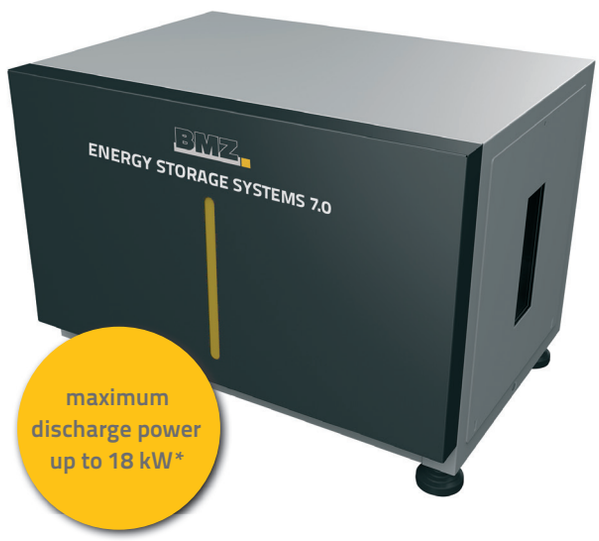
ENERGY STORAGE SOLUTIONS WHICH MAKES YOU INDEPENDENT

YOUR BENEFITS AT A GLANCE:

- Optimal self-consumption during day & night
- Independence from solar radiation and public grid
- Economic, cost-cutting and ecofriendly
- Lightweight, safe and space saving
- Modular installation: the storage capacity can be adapted to your needs
- Subsidized by the Federal Government of Germany: KfW-Program 275

GO WITH THE BEST FOR YOUR CUSTOM-TAILORED SOLUTION

MAXIMUM POWER FOR YOUR BUSINESS



ESS 7.0: Lithium-Ion Power

GET A LONG BENEFIT WITH 5,000 CYCLES

GENERAL PROPERTIES	ESS 7.0
Energy (nom./usable)	6.74 kWh/5.39 kWh
Nominal voltage	55.5 V
Charge end voltage	61.5 V
Discharge end voltage	45.0 V
Capacity (nom./usable)	121.5 Ah/ 97.2 Ah
Max. charge	90 A
Max. discharge current	300 A (3 sec.)
Max. discharge power	18 kW*
Weight	95 kg
Dimensions (mm) W x H x D	638 x 421 x 487 mm
Communication	CAN – SMA ready
Battery chemistry	Li-Ion NMC
Discharge depth	80% DOD
Full cycles	5,000
Battery Management System	Monitoring of cell voltage, cell temperature, current, derating and passive balancing
PERFORMANCE DATA	
Energy density (weight)	71 Wh/kg

FOR YOUR FLEXIBILITY

ESS 9.0: Lithium-Ion Power

HIGH PERFORMANCE FOR YOUR BUSINESS

GENERAL PROPERTIES	ESS 9.0
Energy (nom./usable)	8.5 kWh/6.8 kWh
Nominal voltage	54.0 V
Charge end voltage	61.5 V
Discharge end voltage	45.0 V
Capacity (nom./usable)	156.6 Ah/125.3 Ah
Max. charge	90 A
Max. discharge current	300 A (3 sec.)
Max. discharge power	18 kW*
Weight	97 kg
Dimensions (mm) W x H x D	638 x 421 x 487 mm
Communication	CAN – SMA ready
Battery chemistry	Li-Ion NMC
Discharge depth	80% DOD
Full cycles	5,000
Battery Management System	Monitoring of cell voltage, cell temperature, current, derating and passive balancing
PERFORMANCE DATA	
Energy density (weight)	87.6 Wh/kg

*Valid for ESS 7.0, 9.0 and ESS X

*depends on the respective inverter

FLEXIBLE ADAPTABILITY DUE TO THE MODULAR AND COMPACT DESIGN

MAXIMUM CAPACITY

ESS X: Lithium-Ionen Power

GET A LONG BENEFIT WITH 5,000 CYCLES

GENERAL PROPERTIES	ESS X
Energy (nom./usable)	10.06 kWh/8.05 kWh
Nominal voltage	54.0 V
Charge end voltage	61.5 V
Discharge end voltage	45.0 V
Capacity (nom./usable)	186.3 Ah/149.1 Ah
Max. charge	90 A
Max. discharge current	300 A (3 sec.)
Max. discharge power	18 kW*
Weight	99 kg
Dimensions (mm) W x H x D	638 x 421 x 487 mm
Communication	CAN – SMA ready
Battery chemistry	Li-Ion NCA
Discharge depth	80% DOD
Full cycles	5.000
Battery Management System	Monitoring of cell voltage, cell temperature, current, derating and passive balancing

PERFORMANCE DATA	
Energy density (weight)	101.6 Wh/kg

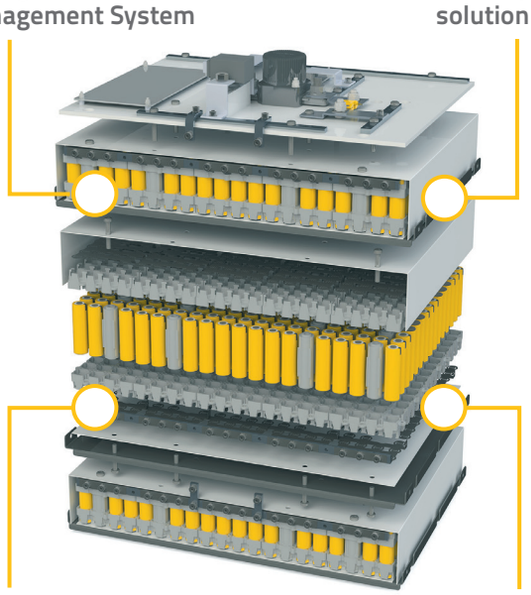
OUR DEVICES ARE UN CERTIFIED FOR SOUNDNESS AND SAFETY

MULTI-LEVEL-SAEFTY CONCEPT

- Short circuit proof relay and 2nd protection (pyro fuse) for a redundant battery cut-off
- Overvoltage and low voltage monitoring for each cell string with redundant battery cut-off
- Temperature monitoring for each cell string and current interrupt device (CID) in each cell
- Protection against a reboot after deep discharge or any other serious error
- No insecure parallel connection of cells without current interrupt device (CID) in each cell
- Active current control as a function of cell voltage and temperature (derating)
- Double metal housing

Intelligent Battery Management System

Future proof solution



High operational safety

Robust and compact design

FEATURES

- Discharge temperature (cells): 2 °C to +45 °C
- Charge temperature (cells): 2 °C to +45 °C
- Recommended storage temperature: 10 °C to 25 °C
- Self discharge (cells): ca. 2 % per year
- Max. parallel connection (of batteries): 12 (additional hardware required)
- Protection class: IP 21
- European Conformity (CE): yes
- UN-test 38.3: yes
- Warranty: 2 year warranty (optional extendable)

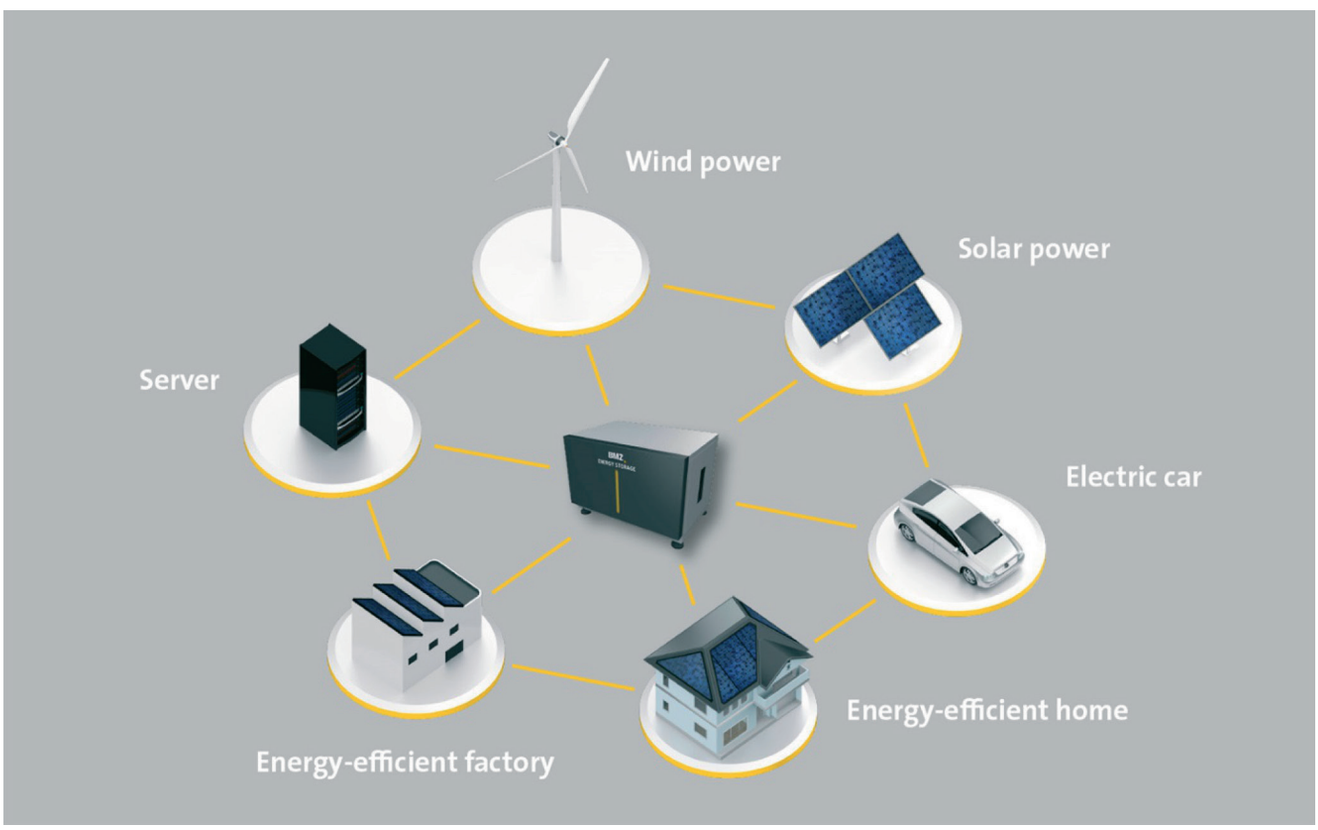
SOUND INVESTMENT FOR THE FUTURE

- Reduction of your energy costs
- Lifetime up to 20 years
- Environmental friendly
- Made in Germany

WE RESEARCH AND DEVELOP FOR YOUR FUTURE - VERTEILNETZ 2020-PROJECT

GRID AND FREQUENCY STABILIZATION – SHORT TERM OPERATING RESERVE MARKET

Primary and secondary power distribution grids face increasing challenges due to the increasing installation of renewable energy sources. Because they were not designed for decentralized power generation, voltage stability and overloading of grid components become increasingly relevant problems.



Schematic representation of a decentralized power generation

Ten partners with different backgrounds are working on increasing the feed-in capacity and improving the power quality in low-voltage distribution grids in the 'Verteilnetz2020" Project funded by the Federal Ministry for Economic Affairs and Energy. To this end they develop novel electrical equipment with extended features regarding voltage control and compensation of harmonics and will test it in the field.

BMZ develops centrally controlled but decentrally located Li-Ion battery storage systems which are operated in an optimal way in order to increase their life while taking into account energy generation and consumption forecasts. The battery storage systems reduce spikes in both energy generation and consumption and can therefore be used to reduce the load of specific grid branches, thus making an expensive increase in the branch capacity unnecessary.

PARTNERS:

A. Eberle (UPFC), BMZ (Battery Storage System), Empuron (Data management), Grass Power Electronics (Inverter), IDS (Grid control centre), Infra Fürth (Grid operator), KACO (PV inverter), PPC (Powerline Communication), TH Nürnberg (Inverter topologies) and TU München (Control algorithms).

Subsidized by

Bundesministerium für Wirtschaft und Energie

aufgrund eines Beschlusses des Deutschen Bundestages

INTELLIGENT LITHIUM-ION BATTERY SYSTEMS FOR YOUR BUSINESS

BMZ Group is a global player with its headquarters, R&D, three production units and a testing and certification side based in Germany. Additional production units are located in Poland, China and the USA, offices are in Japan and France as well as several international R&D sites. Over 20 years of experience in battery technology, more than 2000 satisfied B2B customers, and round about 250 new developments per year show where we are headed. Our staff of 2100 employees and growing is highly dedicated to your success.

TIER-ONE SUPPLIER FOR YOUR APPLICATIONS

We produce re-chargeable battery packs for all market segments and products that use batteries or want to be independent of a power outlet. BMZ is your tier-one supplier of lithium-ion applications like large energy storage systems, e-bikes, power packs for busses, forklifts, e-boats, road sweepers, aerospace applications, power and garden tools as well a medical devices. Depending on your location we can produce close to you to save on transportation and time.

OUR SERVICE FOR YOUR SATISFACTION

- Service hotline
- On-site service
- Original spare parts depot
- Pick up service of failure batteries within 48 h (EU)
- Dispatch of repaired and proofed batteries after 8 working days
- Fully equipped service center
- Skilled and experienced employees

SERVICE-HOTLINE:

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