grz: TECHNOLOGIES

DASH POWER

SOLID-STATE HYDROGEN STORAGE MODULES

PLUG-AND-PLAY

SAFE

COMPACT

POWERING THE FUTURE OF HYDROGEN STORAGE

APPLICATION #1

GRZ Technologies' DASH Power systems are fully containerized, plug-and-play solutions that integrate proprietary solid-state hydrogen storage with automotive-grade fuel cells. These systems include advanced thermal management, auxiliary batteries, and a control system.

Charged with hydrogen from any source, DASH Power systems deliver reliable, on-demand electrical energy tailored to your needs. From affordable power generation to enhanced grid stability and system services, our cutting-edge technology enables the safe and efficient storage of energy at MWh-scale.

UNLOCK THE POWER OF SOLID-STATE HYDROGEN

The "DASH" in DASH Power stands for Dense And Safe Hydrogen, combining high-density storage with secure, efficient energy delivery.

APPLICATION #1: DASH POWER FOR RELIABLE BACKUP POWER SUPPLY

The DASH Power system offers a groundbreaking solution for backup power needs across various industries, needed in applications such as:

DATA CENTERS

Ensures uninterrupted operations and protects vital digital infrastructure.

TELECOMMUNICATIONS

Keeps networks operational during power outages.

MANUFACTURING AND INDUSTRIAL PLANTS

Prevents costly production downtime and ensures safety.

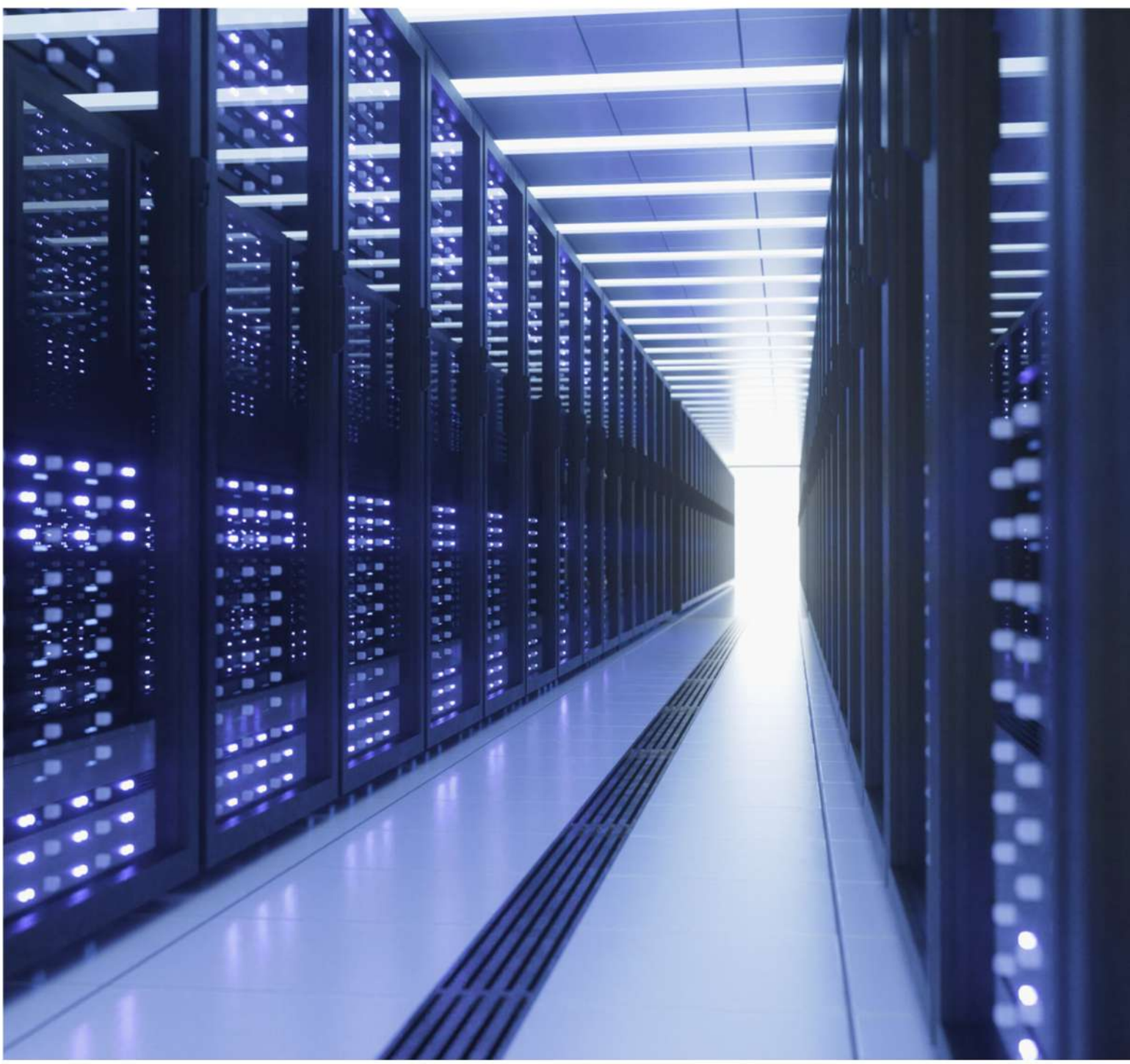
HEALTHCARE FACILITIES

Powers critical medical equipment and refrigeration systems.

APPLICATION #1

Until recently, the standard solution in such cases was the installation of noisy, high-maintenance and polluting diesel generator systems. However, stringent emissions regulations and high maintenance costs have caused a shift towards a next generation of backup power supply systems. In this context, the DASH Power offers an innovative, reliable, and efficient method to supply backup power to critical infrastructure.

The DASH Power can be installed as a containerized solution next to a building, requiring only minor site preparation. Alternatively, an installation within a building is also possible.



APPLICATION #1

The DASH Power is particularly well adapted to backup power supply for extended periods of time, e.g., 48h or longer. A comparison of the DASH Power system with a Li-ion battery impressively shows the advantages of our proposed solution.

A further advantage of the DASH Power is that it is not solely constrained to backup power supply, but can offer a double function: providing backup power in case of shortage, and also providing additional power capacity to prevent an expensive grid expansion.

PARAMETER	TRADITIONAL SOLUTION: LI-ION BATTERY	GRZ SOLUTION: DASH POWER
Backup Power (Avg.)	300 kW	300 kW
Backup Power Duration	72h	72h
Fire Hazard	High	None
Footprint	400 m²	60 m²
Lifetime	< 10 years	20+ years
CAPEX	9'000'000 €	5'500'000 €

CASE STUDY: FISCHER GROUP

FISCHER GROUP'S HYDROGEN-TO-POWER SOLUTION

The fischer group, a leading stainless steel tube producer in Achern-Fautenbach, Germany, is advancing energy efficiency with GRZ Technologies' DASH Power-500-3500 solution. This innovative system optimizes power during peak demand and provides reliable buffer storage for surplus hydrogen, supporting the company's sustainability goals.

KEY DETAILS

CLIENT	fischer group
LOCATION	Achern-Fautenbach, Germany
PROJECT TYPE	Power Optimization and Buffer Storage
PRODUCT USED	DASH Power 500-3500

CHALLENGE

As a high-energy consumer, the fischer group faced rising costs and surcharges during peak power usage, especially in processes requiring heat to the aluminum hot forming quench. The company needed a solution to both optimize power during these peak periods and efficiently store surplus hydrogen produced on-site.

SOLUTION

GRZ Technologies provided the DASH Power 500-3500 system, a versatile solution combining energy optimization with hydrogen storage. The module delivers extra power during peak demand, reducing dependency on the grid, while its solid-state storage safely retains surplus hydrogen for future use. This dual functionality ensures energy availability and supports operational efficiency.

BENEFITS

The DASH Power 500-3500 system enables the fischer group to reduce energy costs by mitigating peak demand and associated surcharges. By integrating hydrogen storage, the solution ensures operational flexibility, energy independence, and showcases their commitment to sustainability through renewable energy innovation.

APPLICATION #2: DASH POWER FOR PEAK SHAVING AND GRID STABILIZATION

As electricity costs rise and grid capacity becomes strained, industries and grid operators are turning to peak shaving solutions to optimize energy consumption. Instead of costly grid expansions, strategically placed energy storage systems can mitigate peak demand and reduce operational expenses. Key applications of the DASH Power for peak shaving include:

MANUFACTURING PLANTS

Lower electricity costs by reducing peak demand, directly cutting monthly power supply fees.

ELECTRICAL VEHICLE CHARGING

Meet the growing demand for fast charging stations without the need for new grid infrastructure.

GRID OPERATORS

Prevent costly infrastructure upgrades like transformer replacements by providing localized peak power.

APPLICATION #2

The DASH Power system offers a flexible, containerized, plug-and-play solution that is easy to deploy with minimal site preparation. Scalable by adding more units, it adapts seamlessly to rapidly evolving energy needs.

PARAMETER	DASH POWER SYSTEM
Power Output (Peak)	500 kW
Investment Cost (Incl. Installation)	1.8M€
Power Shaved (Monthly)	500 kW
Peak Power Value (Avg. €/Month)	35-40€
Typical ROI	< 10 years

CASE STUDY: ENERGIE WASSER BERN

EWB'S RENEWABLE ENERGY STORAGE WITH DASH POWER

Energie Wasser Bern (ewb) partnered with GRZ Technologies to implement a hydrogen-based electricity storage system that stores excess solar energy for on-demand use at electric vehicle (EV) fast-charging stations. This project demonstrates efficient, safe, and environmentally friendly renewable energy storage using hydrogen.

SUSTAINABLE EV CHARGING

At ewb in Bern, the DASH Power system (left) provides safe hydrogen storage, supplying power to a nearby EV charging station (right).

KEY DETAILS

CLIENT	Energie Wasser Bern (ewb)
LOCATION	Berne, Switzerland
PROJECT TYPE	Grid-Integrated Hydrogen Storage
PRODUCT USED	DASH Hydrogen-to-Power System

CHALLENGE

Energie Wasser Bern needed a sustainable solution to store surplus solar power and manage electricity use during peak demand while minimizing fossil fuel reliance. The challenge was to find a compact, safe, and flexible storage system that could operate independently and meet the variable demands of EV charging.

SOLUTION

GRZ Technologies supplied ewb with a DASH Power system, a containerized solution that stores hydrogen safely in solid-state form within metal hydrides. This modular, autonomous system efficiently converts stored hydrogen back into electricity for EV charging, meeting ewb's needs for clean and reliable energy management.

BENEFITS

The DASH Power solution enables ewb to store surplus solar energy as hydrogen, reducing grid load and optimizing renewable energy use. It provides a reliable, emissions-free power source for EV charging, with safe, long-term storage that minimizes environmental impact.

KEY FEATURES

DASH Power modules use patented solid-state technology and advanced metal hydrides to deliver safe, efficient, and sustainable hydrogen storage. Designed for diverse applications, these systems offer a range of benefits:

HIGH-DENSITY STORAGE IN MWH

Store up to 4.5 MWh of electrical energy in a compact 20-ft ISO container with up to 500 kW of power output.

MODULAR DESIGN

The system's modular nature easily adapts to growing demands, ensuring users can expand capacity as needed.

NO COMPRESSION REQUIRED

Eliminates the need for costly hydrogen compressors, simplifying installation and reducing infrastructure requirements.

PROVEN PEM TECHNOLOGY

Equipped with PEM fuel cells from Hyundai Motor Company, ensuring reliable performance with automotive quality standards.

INSTANT START-UP AND REACTIVITY

Quickly responsive, the DASH Power system is ready to deliver backup power or grid services within seconds for critical applications.

REMOTE CONTROL AND OPERATION

Fully controllable via an IP interface, allowing for remote monitoring and operation to ensure that electricity is generated and delivered as needed.

LONG SERVICE LIFE

Built for durability, DASH C systems provide over 20 years of reliable service with minimal performance degradation.

LOW OPERATIONAL EXPENDITURE (OPEX)

With fewer moving parts and no need for compression, DASH Power significantly reduces maintenance costs and extends system lifespan.

LOW EMISSIONS

DASH C operates emission-free, making it a sustainable choice for hydrogen storage.

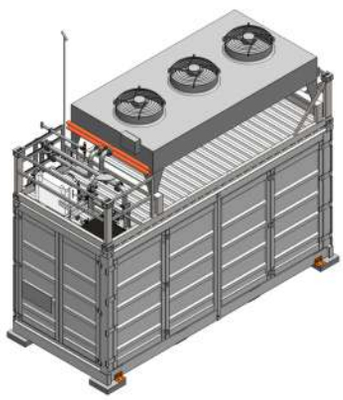
SUPERIOR SAFETY STANDARDS

DASH Power's solid-state, low-pressure design ensures safe hydrogen storage, even in sensitive environments such as residential buildings or industrial sites.

DASH POWER COLLECTION

GRZ's DASH Power provides versatile, high-performance hydrogen-based energy storage solutions tailored for industries requiring reliable, scalable power systems. Offering compact modular units with quick response times, the DASH Power modules are engineered to meet demanding energy needs for critical applications such as backup power for data centers, hospitals, and grid services.

Discover the DASH Power system product range—choose from five different standard variations for a reliable, scalable, and robust hydrogen storage solution.



EXTERIOR VIEW

The DASH Power standardized 20-foot ISO container. All storage variations share identical external components for consistency and streamlined integration.

DASH POWER STORAGE	UNIT	175-900	260-1800	400-2700	500-3500	500-4500
Electrical Power (Peak)	kW_e	175	260	400	500	500
Electrical Power (Avg.)	kW_e	75	160	240	320	320
Hydrogen Storage Capacity	kg H_2	45	90	135	175	225
Total Storage Capacity	MWh_e	0.9	1.8	2.7	3.5	4.5
Time to Discharge at 100% Load	h	12.0	11.3	11.3	10.9	14.0
Weight	t	17.7	21.9	26.1	30.8	35.0
Electrical Interface Output	V AC	3-phase 400 V 50/60 Hz				
Communication Interface	TCP/IP	OPC UA and hardwired				
Ambient Temperature	°C	-5 to +38				
Hydrogen Supply Purity	%	> 4.5 (> 99.995%)				
Hydrogen Charging Pressure	bar(g)	30 to 45				
Max. Efficiency (Incl. Waste Heat)	%	84				
Expected Service Life	years	> 20				
External Cooling Requirements		None				

OPTIONAL ADD-ONS

The DASH Power system offers a range of optional enhancements designed to optimize performance across diverse environments and applications:

WASTE HEAT RECOVERY

Reclaims excess fuel cell heat for external use, boosting energy efficiency.

INTEGRATED AIR COMPRESSOR

Ensures fully autonomous operation when on-site compressed air is unavailable.

FIRE AND SMOKE DETECTOR

Detects fire and smoke with both audible and visual alarms for enhanced safety.

LIGHTNING PROTECTION

Provides robust lightning protection for the container to ensure secure operation.

TECHNICAL SERVICES

Our comprehensive support offerings are designed to keep your DASH Power system running reliably and efficiently:

ON-SITE ASSISTANCE

Expert assistance during setup for optimal system functionality.

TECHNICAL SUPPORT

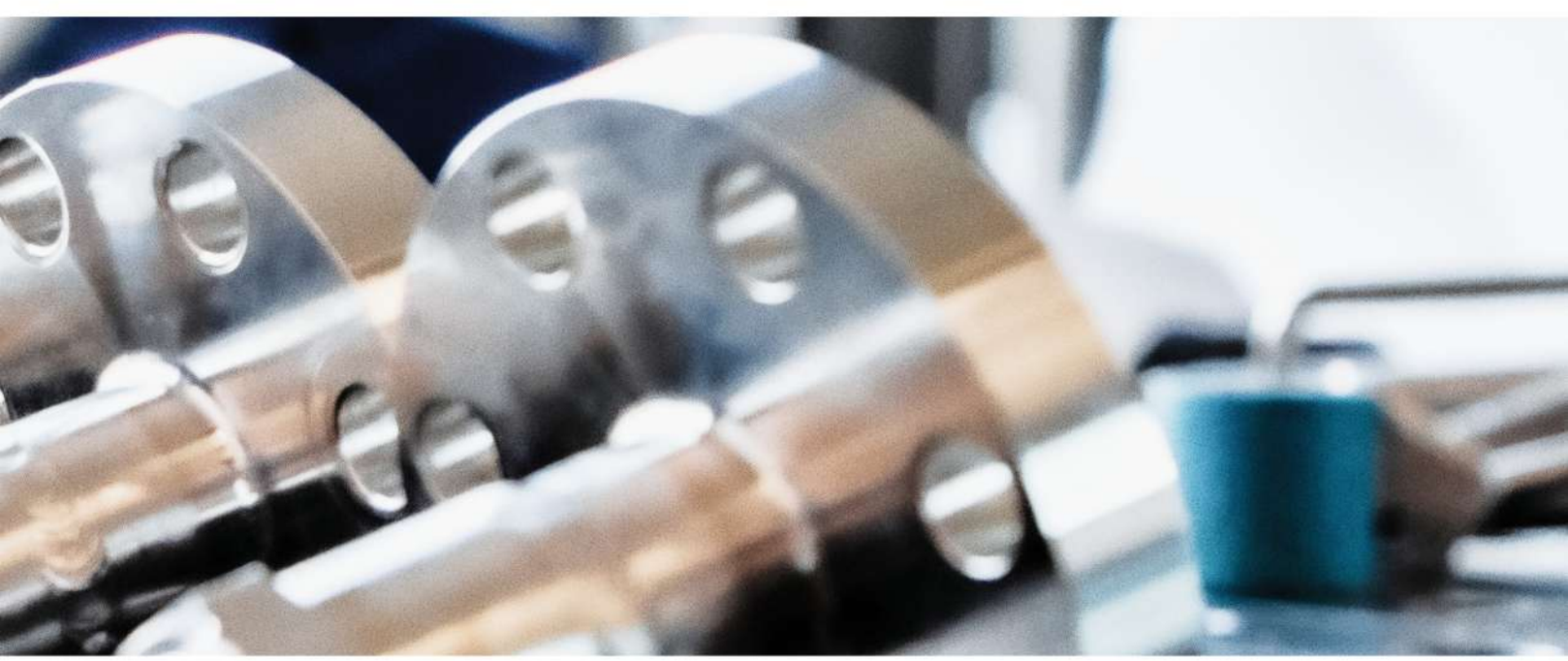
Available remotely or on-site for troubleshooting and preventative maintenance.

SPARE PARTS WARRANTY

Maintain system reliability with warranty coverage for essential spare parts.

WARRANTY EXTENSION

Extend warranty coverage annually when paired with our technical support.



COMPLIANCE

Every DASH Power system is based on the strict quality requirements of GRZ with CE certification that meets international safety and performance standards:

ATEX DIRECTIVE 2014/34/EU

Certified for safe use in potentially explosive environments.

MACHINERY DIRECTIVE 2006/42/EC

Adheres to required safety protocols for machinery design and operation.

PRESSURE EQUIPMENT DIRECTIVE 2014/68/EU

Guarantees safe design and manufacturing of pressure equipment.

LOW VOLTAGE DIRECTIVE 2014/35/EU

Ensures electrical equipment meets safety requirements for low voltage operation.

ABOUT GRZ TECHNOLOGIES

At GRZ Technologies, we stand at the forefront of hydrogen storage innovation, dedicated to reshaping the future of clean energy through our patented metal hydride technology. With decades of research and development, we deliver safe, efficient, and high-density hydrogen storage solutions for diverse applications, from residential use to large-scale applications.

PARTNERSHIPS

Our partnerships with industry leaders like Hyundai, AMPO, Sabanci, and the fischer group propel us forward, enabling advancements in backup power and renewable energy integration—all while prioritizing reliability and cost-efficiency.

A WORLD FUELED BY RENEWABLE ENERGY – DAY AND NIGHT, SUMMER AND WINTER.

Fueled by a passion for a sustainable energy future, GRZ Technologies is not just innovating; we are revolutionizing the storage and utilization of hydrogen, setting new benchmarks for excellence in the industry.

CONTACT US TODAY AND BE PART OF THE CLEAN ENERGY REVOLUTION

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