Jena Flow Batteries GmbH
Corporate brochure 2025

Jena Flow Batteries GmbH is an innovative solution provider for long duration energy storage.

www.jenaflowbatteries.de

Flow batteries for sustainable energy supply

A new chapter in energy storage technology begins

Jena Flow Batteries GmbH

Preface

We are excited to introduce Jena Flow Batteries GmbH, a pioneer in stationary energy storage innovation. Our metal-free flow batteries provide a safe, sustainable, and scalable solution that helps to pave the way for a greener tomorrow.

Built on the strong foundation of Jenabatteries GmbH, the company emerged through strategic acquisitions. Our dedicated core team continues advancing research and development, pioneering the next generation batteries.

The company is a subsidiary of Suqian Time Energy Storage Technology Co., Ltd – the leading Chinese corporation in the manufacturing of metal-free flow battery systems and their key components. By merging the technical expertise and innovative power of both firms, we aim to fully exploit the potential of innovative energy storage. With the synergies at hand, we strive to deliver top-class system solutions that integrate seamlessly into the infrastructure of renewables such as photovoltaic and wind farms – for an efficient and stable electricity supply.

Responsibility and sustainable development are the foundation of our philosophy and guide our corporate mission. Our battery technology stands for quality and reliability, as well as the promise to be a trustworthy partner for industry and society alike. We look forward to bringing our innovative energy storage solutions to the German and European market.

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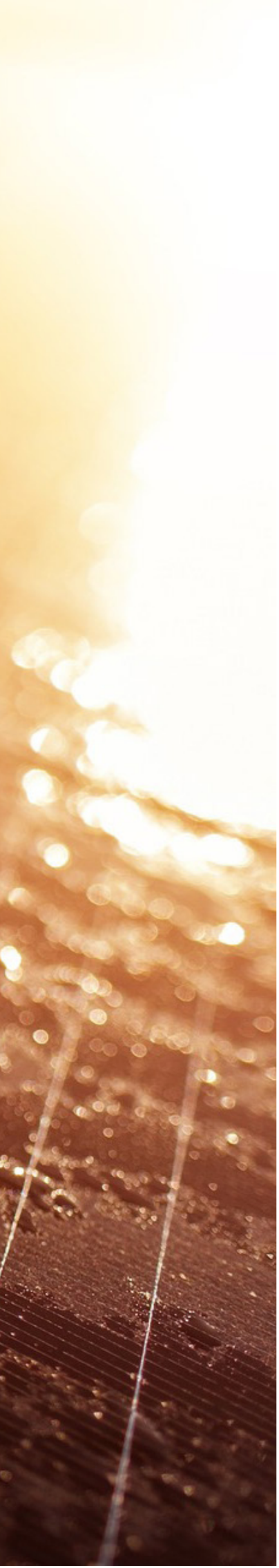
Jena Flow Batteries GmbH

Suqian Time Energy Storage Technology Co., Ltd.

Supporting the European energy transition by sustainable, scalable, and economical storage solutions for a green future



Our vision

Europe is on a mission to create a sustainable, resource-conserving energy system for future generations, strongly backed by the EU's climate protection laws. Yet, the expansion of regional and national power grids are progressing more slowly than necessary. Grid operators, the energy industry, and industrial sectors are increasingly seeking sustainable and efficient solutions to bridge the gap between renewable energy input and the required grid infrastructure. With the growing share of renewables in electricity production, fluctuations due to weather, seasons, and daily cycles are becoming more pronounced. To seize this momentum, the energy transition requires innovative solutions now more than ever.

Our energy storage systems are the key to synchronizing electricity generation and consumption. The timing is perfect: while industry is looking for answers, we offer one of the most sustainable and scalable large-scale storage solutions.

At Jena Flow Batteries, we are leading the way in sustainable storage of green electricity. In partnership with Suqian Time Energy Storage from China, we bring our cutting-edge metal-free flow batteries to the European market. Our technology will have widespread applications in renewable energy, grid stabilization, and industrial processes.

Through close collaboration with Suqian Time Energy Storage and other strategic partners, Jena Flow Batteries is dedicated to driving the energy transition forward and providing reliable solutions for your energy challenges. Together, we can power a greener future.

Overview of technology

Redox flow batteries are advanced electrochemical energy storage devices that store electrical energy through electron exchange, similar to traditional batteries. A scalable system of tanks and electrochemical cells allows for the independent scaling of power and capacity, offering flexible and customized energy storage solutions for diverse applications. Redox flow is short for:

Reduction → electrons are bound

Oxidation → electrons are released

Flow → liquid storage medium

How our system works

In particular, our metal-free flow batteries utilize organic materials dissolved in water instead of metals. These organic salts, previously used in industries like automotive manufacturing, now serve a revolutionary function as energy storage. They can be manufactured sustainably and do not require critical metals or rare earth elements.

1.

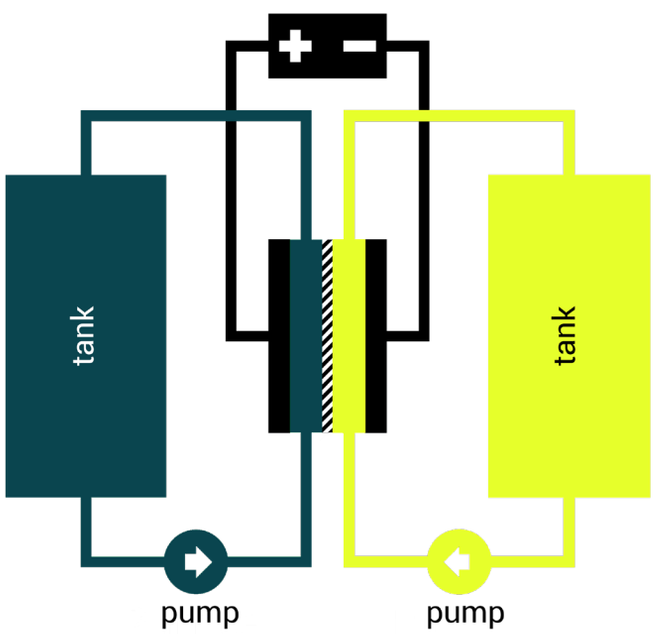
Two tanks hold a saline solution, each containing different storage materials which function as the anode and cathode.

2.

Charging and discharging is achieved by pumping the saline solution through a cell.

3.

Through this process, electrons are bound and released – electricity is stored.



Technology in comparison

Companies around the world are dedicated to innovating and advancing battery technologies. Flow batteries are being developed by various groups across Europe, Asia, and the USA. Jena Flow Batteries, together with our parent company Suqian Time in China, is proud to be at the forefront of this revolution.

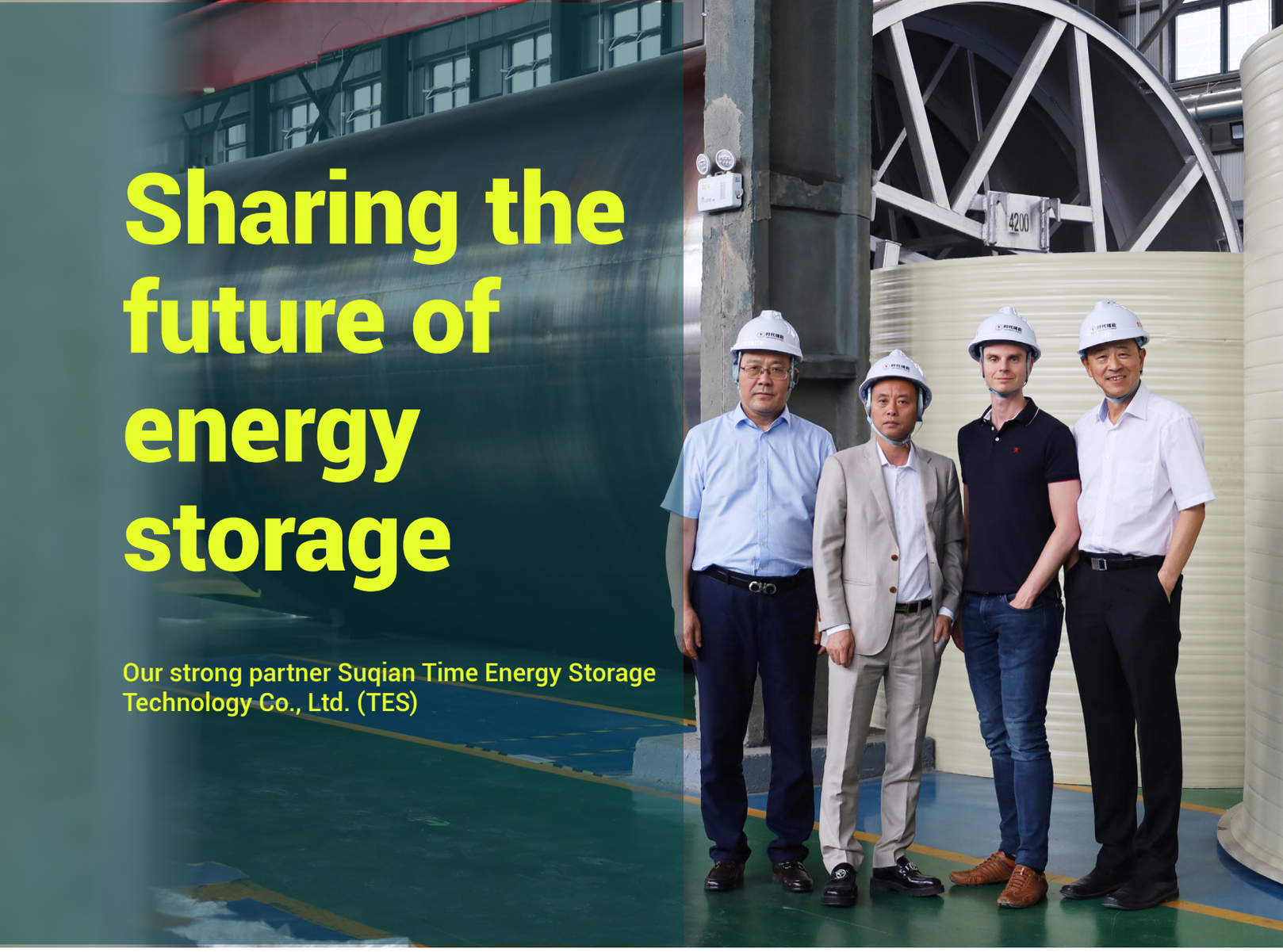
	Lead-acid battery	Lithium-ion battery	Flow battery
Availability of raw materials	✕	−	↗
No thermal runaway	↗	−	↗
Fire safety	↗	−	↗
Easy maintenance	−	↗	↗
Scalability	−	−	↗
Longevity	−	✕	↗
Stationary application	✕	✕	↗
Mobile application	−	↗	−
Low cost over lifetime	−	✕	↗
Long duration storage	−	✕	↗

Environmental benefits of flow batteries

Flow battery systems provide numerous environmental and socio-economic advantages, supporting the transition towards a green energy future.

- **Sustainable lifecycle:** Long-lasting, recyclable electrolytes endure thousands of charge cycles to significantly reduce waste and minimize the environmental impact.
- **Renewable integration:** Efficient management of wind and solar energy provide reliable baseload electricity and enhance grid resilience.
- **Emission reduction:** Paired with photovoltaic plants, flow batteries can reduce greenhouse gas emissions by up to 98% compared to conventional coal power plants.
- **Versatile applications:** Scalable and flexible, ideal for large-scale grid storage and remote energy supply.

Sharing the future of energy storage



Our strong partner Suqian Time Energy Storage Technology Co., Ltd. (TES)

Suqian Time Energy Storage Technology Co., Ltd. (TES) was established in 2021 and specializes in the research and development, manufacturing, and sales of flow batteries.

Since its founding, Suqian Time has developed a water-based, metal-free flow battery system and several key components of flow batteries. Working both independently and in collaboration with leading universities and research institutes worldwide, Suqian Time continues to push the boundaries of energy storage technology. The company has been granted several patents with core technologies related to metal-free flow batteries, laying a solid foundation for future development.

Over the past four years, Suqian Time has built significant manufacturing capacities for membranes, bipolar plates, and stacks. Additionally, the company has secured electrolytes through collaborations with partners and begun constructing a 7 GWh production line for flow batteries.

In 2023, Suqian Time acquired the German-based JenaBatteries GmbH, merging their expertise in metal-free flow battery systems. This strategic partnership leverages synergies and enhances innovation, offering top-tier energy storage solutions. Both companies are committed to providing safe and highly efficient systems to ensure the rapid development of renewable energy, offering robust support for the construction of smart grids, and making a significant contribution to regional development and carbon neutrality.

Jena Flow Batteries

Partnership benefits

Product overview

Our product range includes battery components and models specifically designed for many market segments. From containers to warehouses, we offer solutions in various sizes.

Flexibility: Our battery models are available in different sizes and can be customized to meet your specific requirements.

Scalability: From small containers to large warehouse systems, our battery models provide a scalable solution for every application.

Efficiency: Thanks to our innovative technology, our battery models offer high efficiency and performance.

Customer-specific customizations: We offer you the opportunity to commission specific requirements and customizations. Through close collaboration, individual solutions tailored to your needs can be developed.

Discover the future of energy storage with Jena Flow Batteries GmbH and contact us today for more information!

Flow battery system

Discover the future of energy storage with our cutting-edge, metal-free and vanadium-based flow battery systems.

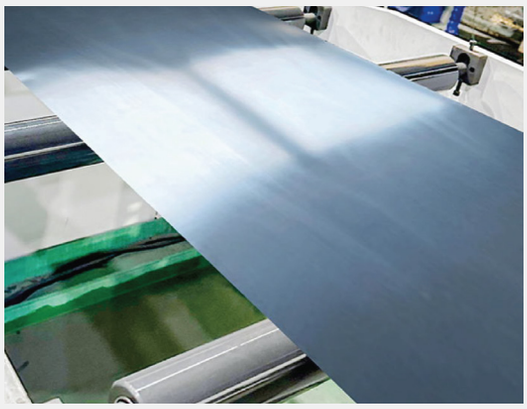
Our batteries are intrinsically safe, non-flammable, and cost-efficient. Designed for secure installation with minimal maintenance, our metal-free flow batteries omit critical raw materials and use water as the electrolyte solvent. The modular system architecture allows for flexible deployment across a wide spectrum of use cases, starting at 250 kW of power and 1 MWh of capacity. Built with scalability at its core, each battery module supports seamless integration with additional units to reach storage capacities of multiple megawatt-hours (MWh). Our standard module supports a 4-hour storage duration, while easily expandable tank configurations enable extended storage durations of 8 hours, 12 hours, and beyond. To further support our clients' unique requirements, we also offer OEM parts manufacturing, delivering custom-designed components tailored to your specifications. Partner with us to deploy a safer, smarter, and more sustainable solution for your energy infrastructure.

→ **Contact our team today to learn how our innovative products can enhance your flow battery systems.**

Bipolar plates

Discover our independently developed bipolar plates, designed with low electrical resistance, high strength, and excellent flexibility.

Our state-of-the-art bipolar plates are perfect for various industrial applications, combining durability with cost-efficiency. With an annual production capacity of 1,000,000 square meters, we are equipped to meet large-scale demands while maintaining high quality.



Flow battery stacks

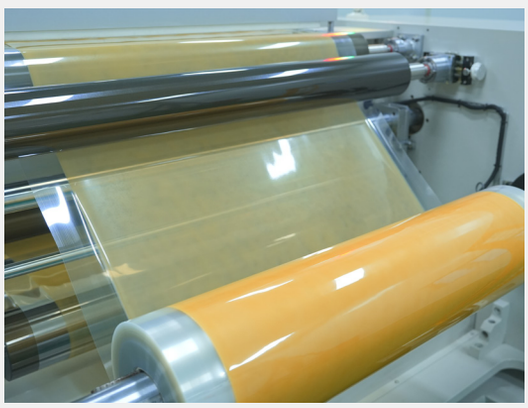
Our battery stack design is engineered for optimal performance and efficiency.

Featuring high electrolyte utilization, an optimized double-layer plate structure, excellent electrolyte flow characteristics, and high energy density, our stacks ensure efficiency and reliability in your flow battery application.
With a rapidly increasing annual production capacity of 500 MW, our stacks are designed to meet large-scale demands while maintaining exceptional quality. Additionally, we offer OEM solutions, allowing you to choose components that fit your needs best.

Anion exchange membrane

Our third-generation Anion Exchange Membrane (AEM) achieve unparalleled performance, stability, efficiency, and durability.

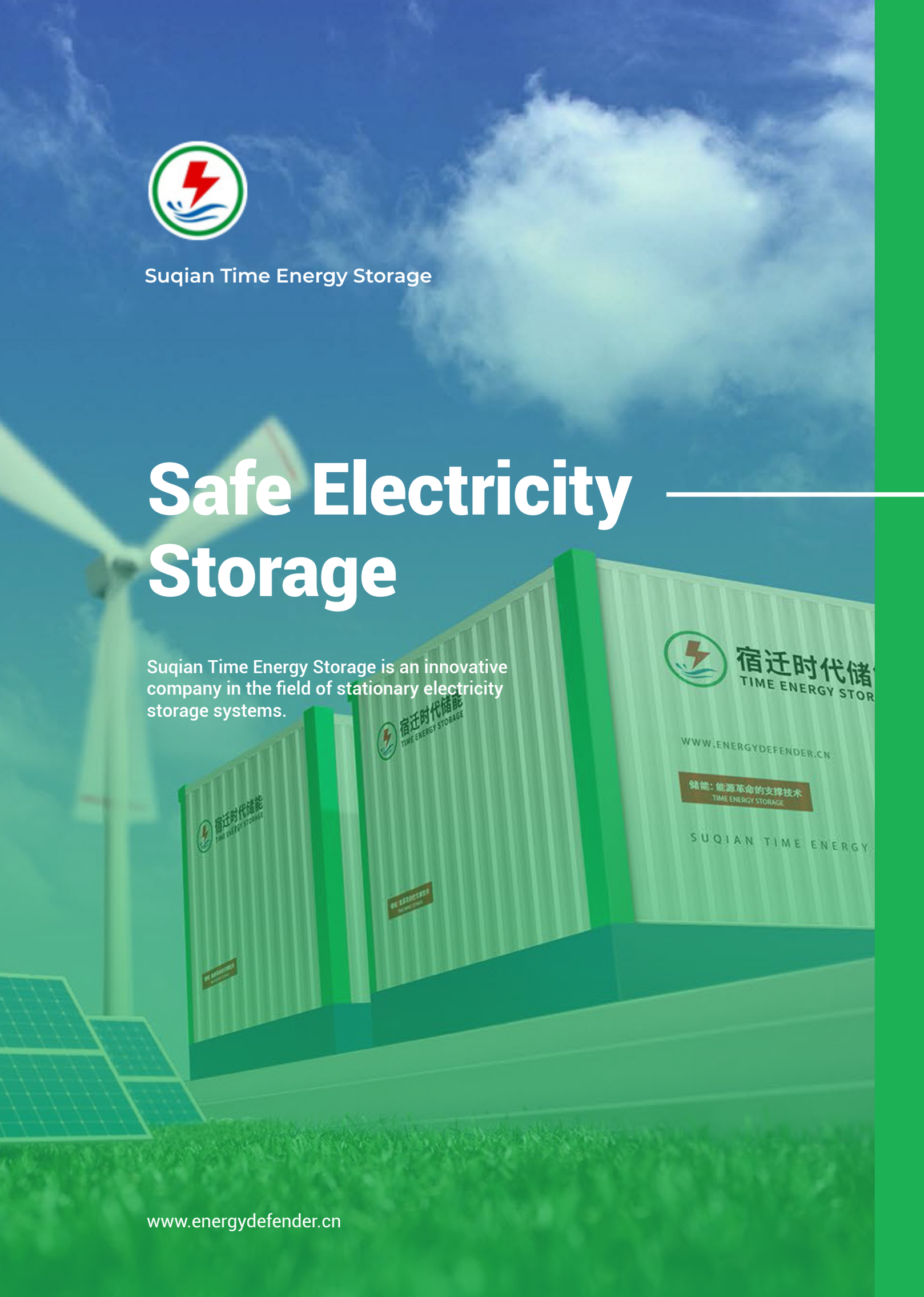
Perfect for electrolysers, flow batteries, and various industrial applications, our AEM offers exceptional benefits. They are free from PFAS, can be customized to different thicknesses and show low resistance. With a high mechanical strength and excellent stability, our AEM has a proven success in many systems.
Our membranes are mass-produced with consistent quality and competitive pricing, boasting an annual production capacity of 1,000,000 square meters.



Suqian Time Energy Storage

Safe Electricity Storage

Suqian Time Energy Storage is an innovative company in the field of stationary electricity storage systems.



www.energydefender.cn

Company profile

Suqian Time Energy Storage Technology Co., Ltd.

More than 70 R&D personnel

8,000 m² research and development building

Suqian Times Energy Storage Technology Co., Ltd. focuses on the research and development, production, and sales of water-based organic liquid flow batteries. Since its establishment, the company has deeply cooperated with multiple domestic and foreign research teams such as University of Science and Technology of China, Xi'an Jiaotong University, and Changzhou University to jointly develop water-based organic flow batteries and their key materials. It has overcome key technical challenges such as material preparation, stack amplification, and battery assembly, mastered multiple core technologies of water-based organic flow batteries, and built the first large width anion exchange membrane production line in China. At present, more than 100 domestic and foreign patents have been applied for, and some of the technologies have received support from the National Key Research and Development Program of the Ministry of Science and Technology. The company is committed to providing safe and efficient energy storage guarantees for the rapid development of the new energy industry, providing strong support for the construction of smart grids, and contributing to the national „carbon peak and carbon neutrality“ strategy.

Business segments

Headquarters:
Suqian, Jiangsu, China

Production Bases:
Suqian, Jiangsu
Shenyang, Liaoning

R&D Center:
Suqian, China
Jena, Germany

International Business:
Suqian, China
Jena, Germany

Key Materials:
Zhonghe Times, Suqian
Shandong Qixing Times, Dezhou

Key milestones

July 2021
Suqian Time Energy Storage Technology Co., Ltd. was established

March 2023
First set of kW-level integrated demonstration projects delivered

September 2023
Series A financing completed under leadership of Hillhouse Capital

November 2023
Asset acquisition of JenaBatteries GmbH

December 2024
Won the first prize of 2024 China Petroleum and Chemical Industry Federation Technology Invention Award

November 2021
Construction of a project with an annual output of 5GWh of metal-free flow batteries began

July 2023
Phase I of metal-free flow battery production line in Suqian production base put into operation

October 2023
First MW-level metal-free flow battery product successfully completed in Suqian production base

April 2024
First overseas MW-level project completed

Operation excellence


中联认证中心（北京）有限公司
环境管理体系认证证书
环境管理体系符合：
GB/T24001-2016/ISO14001:2015


中联认证中心（北京）有限公司
职业健康安全管理体系认证证书
职业健康安全管理体系符合：
GB/T 45001-2020/ISO 45001:2018


中联认证中心（北京）有限公司
质量管理体系认证证书
质量管理体系符合：
GB/T19001-2016/ISO9001:2015

Over 100 Patents
We hold more than 100 patents, showcasing our commitment to innovation and excellence.

CGC Approved
Our products have successfully passed CGC testing, reflecting our dedication to superior product quality and safety.

ISO9001 Certified
We obtained ISO9001 certification for our quality management system which is ensuring the highest standards in our operations.

Award-Winning
We have been honored with over 10 industry awards, recognizing our outstanding contributions and leadership in the field.

The applications

Flow batteries offer safety, sustainability, and longevity, making them highly versatile for diverse applications. They are ideal for everything from power generation and grid support to end-user energy solutions. Additionally, these batteries enhance the stability and economic efficiency of electricity supply and consumption. They are particularly effective in fostering the growth of new power systems and boosting the integration of renewable energy sources.

Power-generation side application

Our batteries can significantly enhance the grid's capacity to integrate solar and wind power. They support peak shaving and frequency modulation, thereby improving the reliability and capability of the power supply. Additionally, the batteries can be integrated with fossil fuel power stations, enhancing their safety, economy, and overall stability.

Grid side application

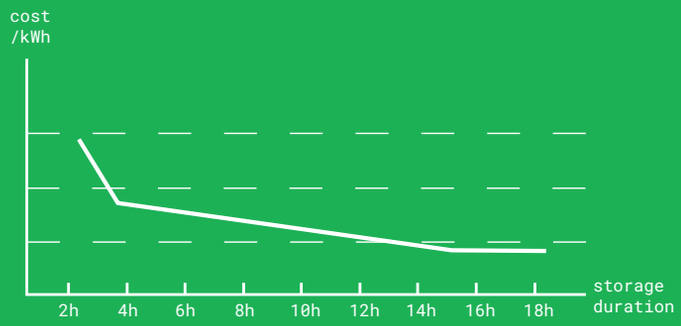
Our batteries can provide crucial services such as peak shaving by storing energy during low consumption periods and releasing it during peak demand. They enhance the reliability and security of power grid operations by balancing disparities in regional power grids. Additionally, our batteries provide a black-start capability, ensuring large-scale power systems can recover quickly and orderly after outages.

User side application

Our batteries help reduce electricity costs by storing energy during low-demand periods and utilizing it during peak times. They provide a reliable standby power supply for enterprises, ensuring uninterrupted production. Additionally, users can establish a self-sufficient energy storage-power supply system by combining photovoltaic and wind power sources with flow batteries.

Use cases

Metal-free flow batteries for long-duration storage



Flow batteries are ready to revolutionize long-duration energy storage, thereby helping to significantly boost renewable energy penetration by up to 50%. Our metal-free system can provide continuous energy storage for ten hours or more, reducing reliance on fossil fuels, stabilizing grid operations, and enhancing energy security. Long-duration energy storage is essential for managing energy supply and demand, making flow batteries an ideal choice for various application scenarios, from grid support to renewable integration.

5 MW / 20 MWh metal-free flow battery system
for long duration energy stroage

1. **Long lifetime**

   Flow batteries boast an impressive lifespan with no solid-state degradation, allowing them to achieve over 20,000 cycles. This long-lasting performance ensures reliability and cost-effectiveness, making them an ideal choice for sustainable energy solutions.

2. **Unmatched flexibility**

   Thanks to their modular design, flow batteries offer unparalleled scalability for diverse applications, from small-scale to multi-megawatt systems. This flexibility allows to provide cost-effective solutions, as shown in the curve.

3. **Superior safety**

   Flow batteries are engineered for absolute safety, with no risk of combustion throughout their entire lifecycle.

Metal-free flow batteries for frequency regulation

In power grids, balancing supply and demand is essential to control the grid frequency. Traditional methods, often dependent on slow-reacting fossil fuel plants, lack efficiency. Our metal-free flow batteries bring a transformative solution with their rapid response capabilities and superior efficiency. By quickly adjusting to shifts in supply and demand, they significantly enhance grid stability. Ideal for frequency regulation and gridforming, our metal-free flow batteries provide a cleaner, quicker, and more reliable alternative, promoting a sustainable energy future. With these innovative systems, grid operators can maintain a stable and efficient energy supply.

China Huaneng Group Co., Ltd. Fujian Luoyuan Power Plant, 200 kW / 400 kWh
Metal-free flow battery system, frequency regulation project

1. **Enhanced safety**

   Our flow batteries are engineered for maximum safety, eliminating the risk of combustion throughout their entire lifespan.

2. **Peak performance**

   Experience peak performance with quick response of our metal-free flow batteries from zero to full power within milliseconds and providing reliable, consistent output for prolonged durations.

3. **Strategic energy management**

   Our metal-free flow batteries effectively utilize 30-70% state of charge (SOC) for optimal frequency regulation, while providing additional reserve capacity for supplementary business models.

Development plan

Adhering to innovation

Our development plan is rooted in innovation. We are dedicated to advancing the next-generation metal-free flow battery system by continuously enhancing battery performance, safety, and cost-efficiency. Our efforts include developing advanced materials, such as third-generation anion-exchange membranes. We are committed to improve the overall system efficiency and boosting the reliability and lifespan of our batteries, thereby ensuring they meet the highest standards for energy storage solutions.

Focus on optimization and upgrade

We are committed to optimizing the performance and efficiency of our existing energy storage products to ensure they remain market leaders. Our goal is to achieve a comprehensive energy efficiency of over 80% by 2025. Through continual improvements, we aim to provide cutting-edge technology at low cost that supports sustainable energy and meets the evolving needs of the industry.

Expand production capacity

We are dedicated to enhancing our production facilities. The Suqian production base achieve a capacity of 1 GWh, expanding to 5 GWh by 2026. The Shenyang production base, set to be completed in 2025, will have a phase one capacity of 2 GWh. Additionally, our ion exchange membrane production capacity will increase to 5 million square meters by 2026. These expansions are designed to meet the rising global demand for our advanced energy storage solutions.

Trustworthy

Practical

Innovative

Win-Win

Green

Jena Flow Batteries GmbH
Otto-Schott-Straße 15
07745 Jena
Germany

Tel.: +49 3641 8793520
E-Mail: contact@jenabatteries.de

LinkedIn: @Jena Flow Batteries GmbH

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250g Cover (art paper, matte finish)

www.jenaflowbatteries.de