SOLAR INVESTOR'S GUIDE

SIG 3/2025

New ideas, new solutions

World's famous innovation hub for solar investors

pv Europe
solar technology and applications

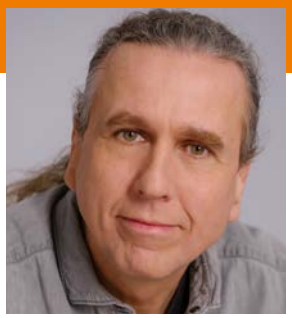

photo: Mildred Klaus

More innovations then ever before

World's famous innovation hub for solar investors: **The smarter E Europe** in Munich leads the way to new products and solutions for the energy transition – in Europe and worldwide. We present the most spectacular ideas for PV, energy storage, e-mobility, system integration and the project business.

More than 3000 exhibitors and 110,000 visitors are expected in Munich this year. In this crowd it becomes difficult to keep tracks of things. But with us you sit in the front row. In this **Solar Investors Guide** we show really cool innovations that will be important for the project business in the coming years. Progress in solar and storage technology, digital leaps, artificial intelligence and new business models will converge. The energy transition is accelerating in all fields of application – driven by innovations.

I want to invite you: Join us!
Even if you can't be there in person, we'll let you participate. We'll be reporting live from the trade fair via video where many exhibitors from all over the world will be showcasing their ideas, products, and solutions.

Heiko Schwarzburger
editor-in-chief
PV Europe & photovoltaik

E-PAPER SOLAR INVESTORS GUIDE

Storage systems to revolutionize the grid

photo: EnBW

Large storage systems become more and more popular in Europe. Important reasons for this are the increasing demand for grid stabilization services and the shifting of peak loads. Italy, Great Britain and Germany are ahead of the game.

And it brings a new lease of life into the project business, which is being hampered by power grid operators almost everywhere in Europe. Technology, availability and prices now enable investors to develop completely new business models. Download the new e-paper now – for free!

▶ ***https://www.pveurope.eu/sig-2025-2-large-storage-systems***

PREVIEW SIG 4/2025

Agri-PV, Floating-PV and Urban-PV

Our next SIG will provide detailed insights into special mounting systems, opening up new applications in agriculture, on lakes and flooded pits, and in public spaces. It will be published on **28 July 2025**.

photo: Erdgas Südwest

The smarter E Europe 2025 is fully booked. More than 100,000 visitors are expected.

photo: Heiko Schwarzburger

Up close with the innovations

PV Guided Tours @ The smarter E Europe ■ We have been expanding our video channel for years. We film on-site, interviewing installers and manufacturers. The highlight is The smarter E Europe. With us, you'll have a front-row seat – even if you can't make it to Munich. Because we're reporting live.

by Heiko Schwarzburger

Intersolar, EES, Power2Drive, and EM-Power Europe are sold out, and all halls are packed to bursting with new ideas and solutions. The exhibition center in eastern Munich is expecting a new visitor record when the doors open on May 7th for this year's leading trade fair for the energy transition.

The most important innovation showcase for the solar energy transition will last three days, and we're right in the middle of it. New solar modules, mounting technology, inverters, storage batteries, and charging technology will be on display in a variety we've never seen before. More and more products are becoming available to installers to meet their customers' needs.

C&I takes center stage

Last year, around 110,000 people visited the halls in northeast Munich. This year, the solar industry's showcase is expected to attract more visitors. The en-

SPECIAL NEWSLETTER FOR INVESTORS

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Every month we send out a special newsletter for the financial sector. Here, private and institutional investors can find out about the opportunities and pitfalls of solar investments.

photo: Gentner Energy Media

Topics in the most recent editions were:

ELTIF offers new opportunities for investors

Large storage systems drive solar project business

Solar parks became more attractive for investors

Floating PV uses water areas for solar parks

Solar projects are penetrating new markets

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▶ ***https://www.pveurope.eu/newsletter-investors***

ergy transition is gaining further international momentum, rolling out across Europe and around the world.

This year, commercial self-generated power systems are likely to be in the spotlight, as this is the segment where complex sector coupling plays a key role. The weak private market is shifting construction to the C&I segments, and solar parks are also experiencing strong growth.

High energy costs have shaken up the EU economy. Now large rooftops and brownfield sites are being systematically developed. Powerful, intelligent solar storage systems will also gain importance in these markets – especially since dynamic electricity tariffs allow for very short payback periods.

Camera for the eye, microphone for the ear

Given the prospering markets, the solar industry, as well as providers of storage technology and charging technology for e-mobility, are keen to showcase their innovative strength. The smarter E Europe will showcase solutions and products that will also be deployed on other continents in the coming years.

The trade media photovoltaik and PV Europe will once again provide special support for The Smarter E Europe this year. Our video teams will be deployed on all three days of the trade fair to document the suppliers' innovations and broadcast them live from the trade fair studio online.

THE SMARTER E EUROPE

Four trade fairs showcase current trends in the energy transition

Accelerating Integrated Energy Solutions: This is the goal of The smarter E, the world's leading trade fair alliance for the energy industry. In the context of a sustainable energy world, the focus is on renewable energies, decentralization, and digitalization, as well as cross-sector solutions for a sustainable, 24/7 energy supply in the electricity, heat, and transport sectors.

This global event series brings together four trade fair brands: Intersolar, ees, Power2Drive, and EM-Power, showcasing innovations that advance the energy industry. It will take place from May 7 to May 9, 2025, at the Munich Exhibition Center.

Intersolar Europe: Innovation showcase for the solar industry

Intersolar is the world's leading trade fair series for the solar industry, focusing on photovoltaics, solar thermal energy, and solar power plants. Since its founding over 30 years ago, Intersolar has established itself as the most important meeting place for the solar industry among manufacturers, suppliers, dealers, installers, service providers, project developers and planners, and startups.

EES Europe: All about storage technology

EES is the international trade fair series for batteries and energy storage systems. It brings together manufacturers, dealers, project developers, system integrators, professional users, and providers of innovative battery technologies and sustainable solutions for storing renewable energies, such as green hydrogen and power-to-gas.

Power2Drive Europe: Electromobility in focus

Power2Drive, the international trade fair series for charging infrastructure and electromobility, is the ideal meeting place for e-mobility providers and charging station operators, manufacturers and dealers, installers and planners, fleet and energy managers, suppliers, and startups. The exhibition series focuses on charging systems, electric vehicles, traction batteries and services, as well as innovative solutions and technologies in the context of renewable energies for sustainable mobility.

EM-Power Europe: Energy system of tomorrow

EM-Power is the international trade fair series for energy management and networked energy solutions. The focus is on the modernization, digitalization, and flexibilization of the power grid towards a smart grid, the integration of prosumers, electromobility, and power-to-heat into a holistic, renewable energy system, and the efficient use of renewable energies. The exhibition series showcases innovative technologies and services for a 24/7 renewable energy supply.

▶ ***https://www.thesmartere.com***

This way, we can bring everyone to the trade fair who might not be able to travel to Munich due to day-to-day business, who have so much work on roofs and in the open that they prefer a quick overview via the internet.

The videos of our PV Guided Tours @ The smarter E Europe will be delivered online immediately after filming. This way, we open the exhibition halls to a much broader and international audience than our on-site presence allows.

CEO Talk: Exciting interviews

In addition, our CEO Talk video format offers exciting interviews with key players in our industry and explores new trends. This makes The smarter E Europe a mix of in-person meetings and virtual participation – in German and English.

Our videos have been viewed well over a million times so far. YouTube only counts direct views. Embedded videos are not included, so the number of unreported videos is likely considerably higher.

Naturally, the number of views grows over time. This means that the longer the videos are online, the more frequently they are viewed. This has to do with the distribution mechanisms of search engines on the internet. But that's not all. We support the videos on our social media channels, use them regularly on our website, and in our newsletters.

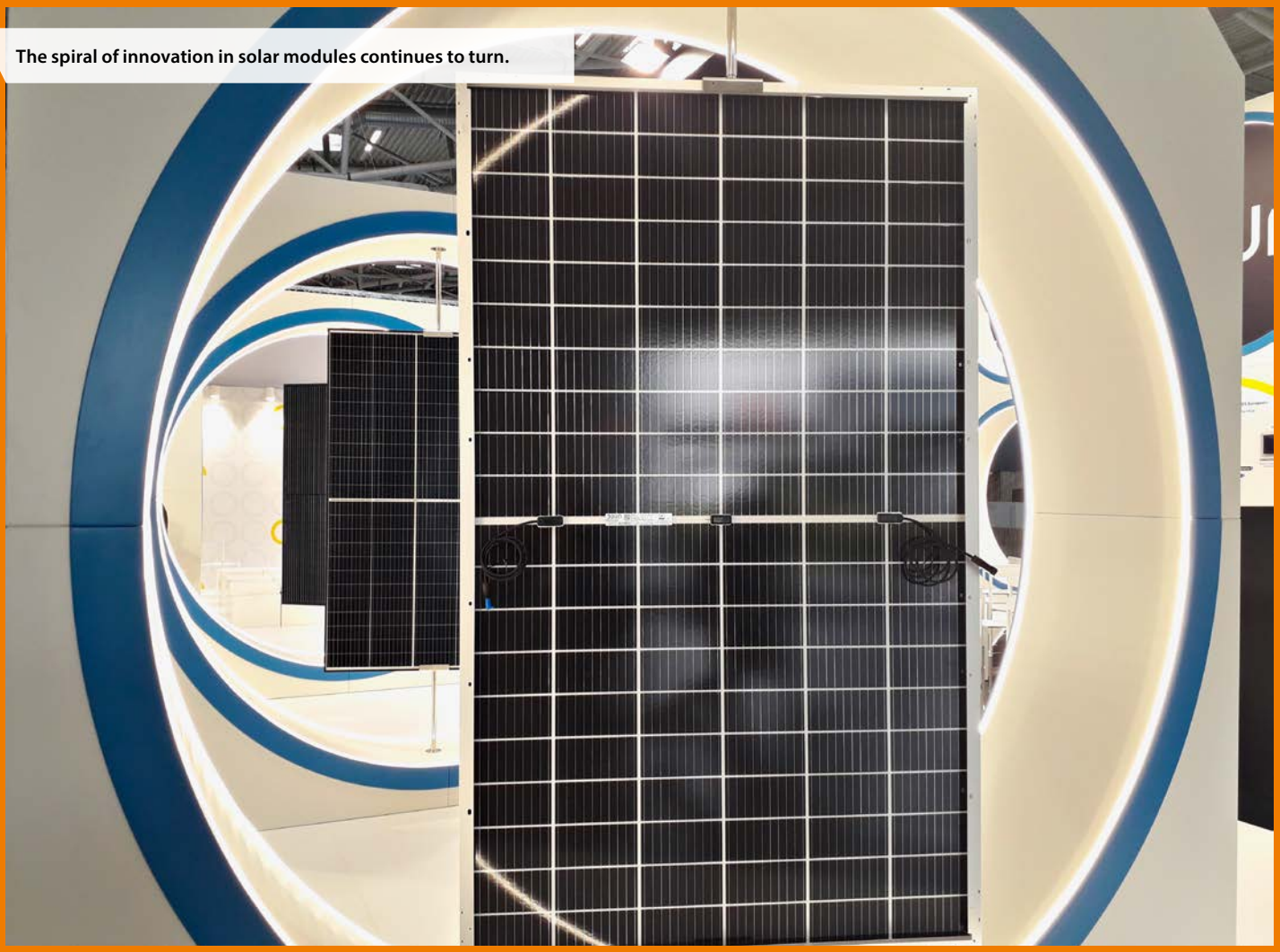
Finding and engaging viewers

Putting a video online doesn't necessarily mean it will find its viewers. This requires a strategy and a mastery of online media. We've done this very well in recent years.

The number of our users shows that media behavior is changing. With our PV Guided Tours, we've proven that complicated technical content can be conveyed to experts in an entertaining way.

Now we're planning the PV Guided Tours @ The smarter E Europe in May 2025, returning to Munich with you and for you. It will be exciting days, that's for sure. Curtain up, let the show begin! Check it out on the PV Europe video channel:

▶ ***https://www.pveurope.eu/videos/pv-guided-tours-2024***



The spiral of innovation in solar modules continues to turn.

photo: Heiko Schwarzburger

Still dynamic: More innovations in photovoltaics

The smarter E Award ■ The finalists in this category reflect the trends and challenges of the market. Even though conventional solar modules have become much more powerful and efficient in recent years, available space remains a limiting factor in the expansion of solar energy. **by Heiko Schwarzburger**

Technical developments are moving toward innovations that open up previously unused space for solar installations. These include particularly lightweight modules or modules with high yields on the back. They are suitable for vertical installations in agriculture or on noise barriers.

Main trends in inverters are focused on integrating additional functions to support the grid and ensure their security. This is especially relevant in C&I applications and solar parks. Examples include phase-accurate feed-in, connection to weak grid nodes, grid-forming functions, and improved monitoring of operating parameters.

ABC INFINITE Module by Aiko Energy Germany GmbH

In the ABC INFINITE module, there are no longer any gaps between individual solar cells. This increases the output per unit of surface area and also ensures a highly uniform appearance. Aiko has also improved the efficiency of the ABC solar cells, in part by using very lightly doped silicon wafers that give the charge carriers a very long service life. When combined with busbarless interconnection, this results in module efficiency levels of over 25 percent. (Booth A3.470)

▶ *https://aikosolar.com/en/*

Aevy Asset Management by Aevy

Aevy is an AI-assisted Virtual Asset Management (VAM) platform for onshore wind and large-scale PV plants, developed as a cloud-based software solution (SaaS platform). Using a combination of artificial intelligence and a domain-specific data structure, Aevy automatically extracts, analyzes and contextualizes documents, enabling highly efficient administration of contracts, maintenance plans and financial reports. Asset managers gain immediate access to accurate information, reduce overheads and increase system efficiency. Aevy turns complex data administration into a competitive advantage for operators and investors. (Booth C5.270D)

▶ *https://aevy.io/*

AUTOPV by 7Secondsolar (Pty) Ltd

AUTOPV is an innovative software solution for planning multi-megawatt PV installations in an intelligent and cost-effective way. It enables real-time iterations, thereby automating the design process. The program calculates precise, viable system layouts with optimum cable routes, component placement and detailed loss analyses. It also provides comprehensive bills of materials and CAD drawings. This makes it possible to compare different scenarios quickly and effortlessly to minimize construction costs and maximize energy yields. AUTOPV has already been used to successfully plan PV installations with an output of over 1.8 GW. (Booth C5.370D)

▶ *https://www.7secondsolar.com/*

Hi-MO X10 by LONGi Solar Technology Co., Ltd.

The Hi-MO X10 uses passivated contacts for both contact polarities, thereby achieving efficiency levels of up to 24.8 percent. LONGi combines this with its proprietary TaiRay wafer, which promises improved mechanical properties. The solar cells in the Hi-MO X10 are also designed for "shading-optimized" behavior, which means that an individual solar cell acts as a bypass diode itself should it become shaded. This minimizes losses caused by localized shading, as the entire solar cell string is no longer "bypassed", and also reduces the danger of hotspots on the solar cells. (Booth A2.170)

▶ *https://www.longi.com/en/*

Kunlun Series Ultra-high Bifaciality HJT Solar Module by Anhui Huasun Energy Co., Ltd

The Kunlun module series was designed for vertical installations. The heterojunction solar cells used can process light that falls on the front and back panels almost equally effectively, giving them a bifaciality of close to 100 percent. The 3.1-square-meter modules reach outputs of almost 770 W, which corresponds to an efficiency level of 24.75 percent. The Kunlun series uses steel alloy frames and holds loads up to 2,400 Pa. Huasun also offers a 30-year guarantee on the module's electrical output, the degradation of which amounts to less than 9.7 percent after 30 years. (Booth A2.550)

▶ *https://www.huasunsolar.com/*

MBJ Sunlike Lab by MBJ Solutions GmbH

The MBJ Sunlike Lab is a solar simulator with built-in electroluminescence measurement for PV modules. It is designed for modules of up to 1.4 meters by 2.5 meters in size and uses 32 LEDs. It can be used for both continuous light and flash operation. The Sunlike Lab offers a spectral coverage of more than 99.5 percent and a spectral deviation of less than 10 percent. This means that the solar spectrum is modeled extremely accurately and, in many cases, spectral mismatch is avoided entirely. (Booth A2.617)

▶ *https://www.mbj-solutions.com/*

PV Inline by Weidmüller Interface GmbH & Co. KG

With PV Inline, Weidmüller has developed a space-saving solution to protect PV installations on large buildings against lightning and overvoltage. Installers often come across tight installation environments, especially at the point where the PV power lines enter the roof. This solution addresses this issue by offering a choice of Type I and Type II overvoltage arresters, which can be easily integrated directly into standard cable ducts using plug-in connections. (Booth B4.340)

▶ *https://www.weidmueller.com/int/index.jsp*

PV:1525-IV by Seaward Electronic

The PV:1525-IV is a high-performance, portable testing device for PV installations with up to 1,500 V DC and 25 A, which combines output analysis,

photo: MBJ Solutions GmbH

The MBJ Sunlike Lab is a solar simulator with built-in electroluminescence measurement for PV modules.

photo: Anhui Huasun Energy

The new Kunlun module series was designed for vertical installations.

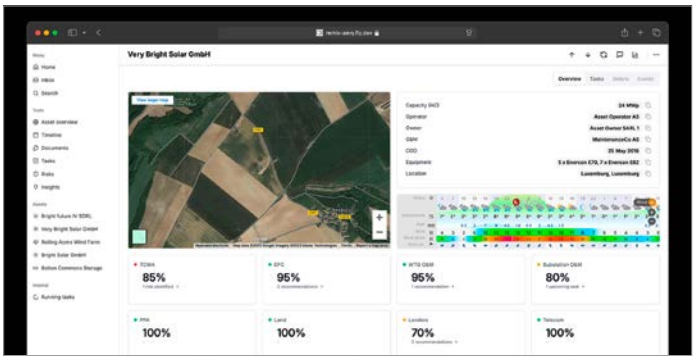


photo: Aevy

Aevy introduced an AI-assisted Virtual Asset Management (VAM) platform for large-scale PV plants.

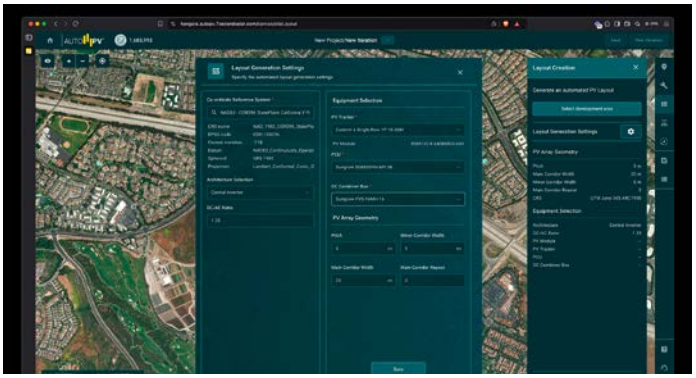


photo: 7Seconds

AUTOPV is an innovative software solution for planning large PV installations.

electrical safety tests and intuitive user navigation. IV curve analyses and advanced diagnostic tools provide accurate fault detection to quickly identify power derating, cabling faults or module degradation and ensure maximum system performance. Bluetooth connectivity enables seamless integration into modern maintenance and installation processes, making it ideal for PV installers and O&M teams.

▶ *https://www.seaward.com/gb/*

SG350HX-20 String Inverter by Sungrow Power Supply Co.,Ltd.

The SG350HX-20 string inverter from Sungrow boasts a high power density and consistently targets the utility-scale sector. This is reflected in features such as very high string voltage and currents, which can be connected on the DC side. Operation and maintenance are supported by continuous insulation monitoring, a self-learning PV characteristic curve diagnostic tool and a self-cleaning function with a reversed fan blast direction. (Booth B3.310)

▶ *https://en.sungrowpower.com/*

Sunmaxx PX-1 by Sunmaxx PVT GmbH

When it comes to decarbonizing buildings, cities in particular need a fossil-fuel free heating supply with space-saving solutions. The combination of monocrystalline TopCon solar cells and flat plate collectors enables efficient dual use of roofs in conjunction with heat pumps. The Sunmaxx PX-1 modules have an electrical output of 440 W combined with a solar thermal output of 1,522 W. At 29 kilograms, they weigh only slightly more than comparable PV modules and can be easily installed using thermal plug-in connectors with a flexible hose. With heating costs of only 6 to 8 eurocents/kWh, amortization can be achieved in 7 to 9 years. (Booth A1.151)

▶ *https://sunmaxx-pvt.com/*

PODCAST SOLAR INVESTORS GUIDE

Prospects for investments in solar and large battery projects

Investing in solar is particularly attractive when module prices are low, as they are right now. But that could be about to change. Also on the move is the battery storage market. It is currently very attractive, especially for investments in large storage systems. But this window of opportunity may soon be closing. We spoke to Dutch market analyst Gerard Scheper about when this might happen, why, and who the key players are.

His company European Solar advices investors and publishes reports with market insights from around the world. He says, the prospects are good but there are some risks lurking there that should not be underestimated. Duration of the podcast: 45:08 minutes

▶ *https://www.pveurope.eu/podcast*

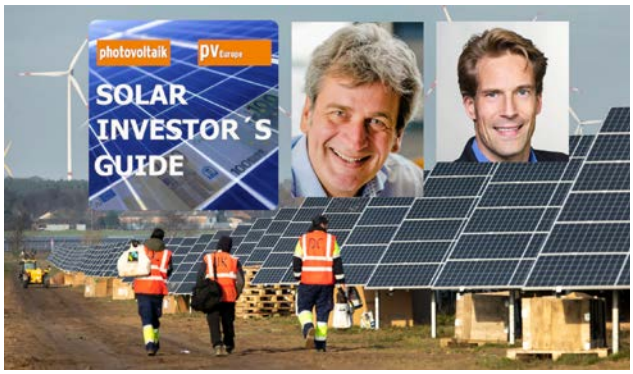


photo: Paul Langrock/EnBW

photo: CMBlu Energy

CMBlu Energy's Organic Solid Flow Battery is an energy storage system that is considered a flow battery but does not require lithium or other metallic components in its organic electrolytes.

Storage systems: Hotspot of the energy revolution

The smarter E Award ■ What is noticeable in this year's applications in the Energy Storage category is that many manufacturers have taken installation challenges into account. When it comes to home storage, there is a trend towards systems that can be modularly stacked and contact each other automatically.

by Heiko Schwarzburger

The number of devices suitable for outdoor use is also increasing. Industrial storage and large-scale storage are delivered ready for installation. In cell chemistry, development is moving very much towards lithium iron phosphate. Significantly larger cells reduce the effort required for interconnection and the costs.

The market for short-term storage of up to four hours is becoming more important. Many battery containers have a maximum charge/discharge rate of 0.25C. Modern systems use artificial intelligence to detect errors and control the energy flow.

Power electronics based on silicon carbide are being used more and more frequently to increase efficiency and power density. System safety remains the focus and is being improved through the increased use of arc detection and multi-level safety concepts at various system levels.

A-CAES by Hydrostor Inc.

With its Advanced Compressed Air Energy Storage System, Hydrostor has developed an emission-free variant of a compressed-air energy storage system with an 8 to 24 hour storage duration. The heat generated during compression is stored and added back to the process during decompression. Additional heating with fossil fuels is no longer necessary. At locations near the power grid, conventional mining technologies are used to create storage volume. These are filled with water and supplemented by an

photo: Hydrostor

Advanced Compressed Air Energy Storage System, Hydrostor has developed an emission-free variant of a compressed-air energy storage system.

photo: p&e power&energy

The Scalable Cell Level Power Electronics Platform features a bidirectional battery inverter system.

above-ground reservoir. Pressurized air pushes the water into the upper reservoir; when discharging, the process is reversed. Hydrostor indicates an area requirement that is about 10 times smaller compared to conventional pumped-storage power plants and a project pipeline of currently 7.5 GW. (Booth B0.240)

▶ *https://hydrostor.ca/*

ESS LUNA2000-215-2S10 by Huawei Technologies Co.

Huawei Technologies' ESS LUNA2000-215-2S10 is an all-in-one commercial & industrial (C&I) storage system with 215 kWh/108 kW and a hybrid cooling system that uses a combination of air and liquid cooling. The company claims that this reduces energy consumption by 30 percent. When this is included in the round-trip efficiency, the system achieves 91.3 percent, which the company also reports is the highest efficiency of any comparable system on the market. Cell temperature differences are kept below 2.2°C, which is said to enable a service life of 15 years at two full cycles/day. Charge and discharge optimization at the pack level ensures 100 percent depth of discharge and results in 20 percent more total energy throughput over the lifetime. (Booth C1.110)

▶ *https://solar.huawei.com/en/*

Mr. Big by EVE Energy Co.,Ltd.

With the Mr. Big battery cell, EVE Energy delivers a 628 Ah capacity, iron phosphate cell that can be operated at 25°C with an efficiency of 96.2 percent. The size of this cell minimizes the number of cells required for a large-scale storage system, which in turn reduces the complexity of the system and lowers costs. Mr. Big is used as part of the Mr. Giant system. This is a liquid-cooled large-scale storage system with a capacity of 5 MWh at a system voltage of 1,331 V. It is designated as having IP 55 protection and can be operated in a temperature range of -40 to +55°C. (Booth B1.431)

▶ *https://www.eveenergystorage.com/*

Organic SolidFlow Battery by CMBlu Energy AG

CMBlu Energy's Organic Solid Flow Battery is an energy storage system that is considered a flow battery but does not require lithium or other metallic components in its organic electrolytes. The system, which will be available on the market in 2027, has a capacity of 200 kWh and an output of 40 kW. The system is neither flammable nor explosive and belongs to what are known as organic flow solid batteries, one of the manufacturer's proprietary technologies that contains, in addition to the electrolyte, solid organic polymers. The projected cycle life is 20,000, and the efficiency is stated as at least 90 percent. (Booth B2.354)

▶ *https://www.cmblu.com/en/home/*

Power 6.25MWh 4h BESS by Xiamen Hithium Energy Storage Technology Co., Ltd.

With the Power 6.25 MWh 4h BESS, Hithium has developed a battery container for the growing market for 4h storage devices that achieves the highest energy densities of 145 Wh/l with 6.25 MWh storage capacity inside a 20ft high cube container. This is made possible by the proprietary 1,175 AH / 3.75 KWh LFP battery, which is the first commercial cell to exceed 1,000 Ah. The resulting reduction in secondary components such as cell connectors can achieve cost reductions that will enable a system price of around 75 to 80 US dollars/kWh as early as 2025. The system also features a comprehensive safety and balancing concept, and the cell used is specified to last for >11,000 cycles. (Booth C2.510)

▶ *https://en.hithium.com/*

photo: Xiamen Hithium Energy Storage

With the Power 6.25 MWh 4h BESS, Hithium has developed a battery container for the growing market for 4h storage devices.

PODCAST SOLAR INVESTORS GUIDE

Long-term storage with iron flow technlogy

Energy Center is an iron flow storage system from ESS Inc., a company located in Oregon in the United States. The storage device offers 1.16 megawatt hours of storage capacity and a maximum charging capacity of 174 kilowatts. This modular solution comes completely in a container and can be adapted to many commercial and network applications. Alan Greenshields is CEO of ESS. He talks about long-term storage systems and the prospect of redox flow technlogy with sustainable materials – iron, salt and water. Duration of the podcast: 43:27 minutes

▶ *https://www.pveurope.eu/podcast*

photo: ESS/ private

PowerOcean DC Fit by EcoFlow

With the PowerOcean DC Fit, EcoFlow is presenting a 5 to 15 kWh battery residential storage system that is particularly suitable for retrofitting to existing PV systems that do not have storage. The storage system is installed on the DC side, between the PV modules and the PV inverter, so that no additional inverter is required, thereby reducing costs. In addition, the DC-side integration results in a higher system efficiency and the registration process is simplified because no changes are made on the AC side. The storage system also features a compact and modular stackable design and integrates a safety concept with LFP batteries and a modular extinguishing system. (Booth B1.170)

▶ *https://homebattery.ecoflow.com/de/products/PowerOcean*

photo: EcoFlow

PowerOcean DC Fit by EcoFlow is a 5 to 15 kWh residential battery system that is particularly suitable for retrofitting to existing PV systems on homes.

Powerstation 2.500 by SOL Research

The Powerstation 2.500 from SOL Research is an innovative combination of a charging station for electric motorcycles and a storage device for a balcony PV system. The removable motorcycle battery can be inserted into the station, which means it can be used as a PV storage unit when not needed for riding, thereby reducing overall emissions. With MPPT (Maximum Power Point Tracking) connections for a PV system and AI-supported energy management that takes PV generation forecasts and dynamic electricity prices via integration with an app into account, the storage system has all the important features of a balcony storage system and combines this with an appealing and modern design. (Booth B0.360)

▶ *https://www.sol-research.com/*

PowerTitan 2.0 by Sungrow Power Supply Co.,Ltd.

The PowerTitan 2.0 from Sungrow Power Supply is a large-scale storage system based on a 20-foot container that includes both the batteries and the power electronics, achieving 5 MWh of storage capacity and 2.5 MW of power. Inside the container, the system is divided into 12 independent storage units, each with its own power electronics. This allows the capacity of the individual units to be better utilized without mutual limitations. Sungrow Power Supply claims that this improves system discharge by 8 percent. The safety system includes, among other things, four-stage overcurrent and arc protection. (Booth B3.310)

▶ *https://en.sungrowpower.com/*

photo: Sungrow Power Supply

The PowerTitan 2.0 from Sungrow Power Supply is a large-scale storage system based on a 20-foot container.

Scalable Cell Level Power Electronics Platform by p&e power&energy GmbH

The Scalable Cell Level Power Electronics Platform features a bidirectional battery inverter system. This shifts the BMS functionality and protection to each individual cell, meaning that each battery cell is controlled individually and the system offers the option of simply disconnecting defective ones. This structure increases efficiency to up to 99.5 percent. Using this patented technology, current systems are capable of providing system voltages of 1,500 V at currents of up to 200 A. The technology can also be scaled flexibly and is available under license to system manufacturers. (Booth C5.280A)

▶ *https://p-and-e.com/*

U8A1 by SAMSUNG SDI

The U8A1 uninterruptible power supply (UPS) solution from SAMSUNG SDI offers at 8C what the company claims is the highest discharge rate in this range. The adapted temperature control design has increased performance by 43 percent compared to the previous system. A power density of 263 kW per rack or 763 kW/m² is achieved. This significantly reduces the space required, which in turn lowers storage costs. The higher discharge rate at the same capacity means that the required power can be realized with fewer cells, which in turn reduces the total cost of the UPS. (Booth C3.310)

▶ *https://www.samsungsdi.com/*

photo: GoodWe

The Vela Series Residential Solar Carport from GoodWe is an innovative solution.

photo: Friedrich

The URBANROOF from Friedrich GmbH boasts a resource-conserving, wooden design.

Charging EVs: Full power ahead

The smarter E Award ■ A striking feature of the applications in the E-Mobility category is the numerous solutions for solar carports. Charging with high currents and voltages, in conjunction with the MCS charging standard, is proving to be a driver of innovation. **by Heiko Schwarzburger**

New legal requirements for roofing large parking lots are clearly having an impact. And special safety components are being developed specifically to meet these new requirements. Another trend is the use of solar cells on commercial vehicles to utilize the surface area of a trailer for energy generation.

40kW SiC High-Efficiency High-Power Charging Module by Shenzhen Kehua Hengsheng Technology Co.

The EV3102-040K-HR-UC SiC charging module from Kehua Tech boasts an outstanding energy efficiency of up to 97 percent, standby consumption of just 7.5 W, and power-dependent efficiency optimization when using multiple charging modules, which both minimizes energy consumption and significantly reduces operating costs. Thanks to its wide output voltage range of 150 to 1,000 VDC and an operating temperature range of -40°C to +75°C, the module offers remarkable adaptability to various environmental conditions. An intelligent fan algorithm ensures quiet operation, which is advantageous in inhabited areas. The charging module can be used universally thanks to global certifications. The "hot-plugging " function and automatic module detection increase ease of maintenance. Finally, the charging module is competitively priced and boasts a low total cost of ownership, making it an economically attractive choice for charging station system integrators and making the expansion of DC charging infrastructure more economical. (Booth C6.140)

▶ *https://www.kehuasz.com/*

Bidirectional high power DC contactor C330 by Schaltbau GmbH

Schaltbau's C330 bidirectional high-power DC contactor is designed for megawatt charging stations and allows currents of up to 3,000 A. The use of air

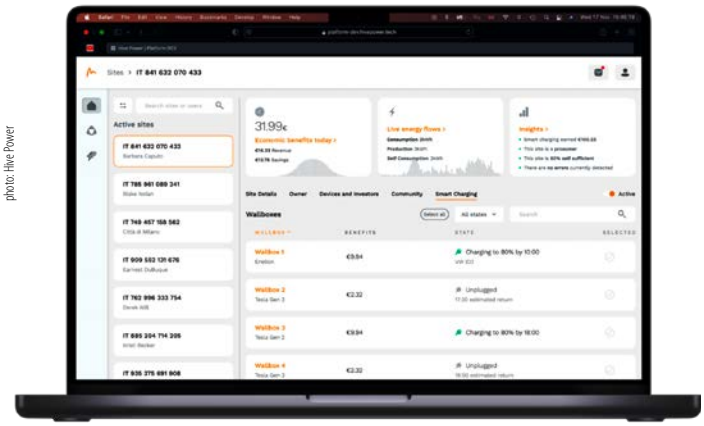


photo: Hive Power

Hive Power FLEXO Smart Charge is an innovative SaaS solution that aggregates electric vehicles and other electrical assets into one virtual power plant.

insulation instead of an inert gas prevents overheating, overpressure and explosions, thereby increasing operational safety. Silver alloy main contacts minimize resistance to 35 µOhm, reduce energy loss and improve efficiency. With a short-term current carrying capacity of 30,000 A, the C330 ensures high system stability. Its compact design makes it suitable for MCS charging stations and vehicles. (Booth B2.476)

▶ *https://schaltbau.com/en/*

Innovative cable-management for AC wallboxes

The Cable-Sherpa's innovative approach to cable management for AC wallboxes , significantly increasing user-friendliness and safety, is impressive. Its automatic cable rewinding mechanism demonstrates technological creativity. Charging cables are kept organized and away from the floor, protecting them from environmental damage and reducing tripping hazards. Compatible with various wallboxes and charging cables, and supporting cables up to 7 meters long, it offers unique flexibility and a wide range of up to 5.5 meters. The product's durability has been confirmed in tests with over 10,000 charging cycles. In addition, the Cable-Sherpa's affordable price and easy installation enable significant cost savings compared to other solutions and avoid premature defects in charging cables and plugs. All in all, the Cable-Sherpa combines technological innovation, sustainability, economic viability and contributes to a higher level of charging convenience. (Booth C5.660B)

▶ *https://cable-sherpa.com/*

DEHNguard M DC ACI 1250 FM by DEHN SE

German company DEHN SE presents the DEHNguard M DC ACI 1250 FM, a type 2 power protection switch with integrated overvoltage protection for DC charging stations. This compact unit combines two safety devices in one single component. It is suitable for DC charging stations of up to 1,250 volts, which means it can be used for CCS charging stations and, with some restrictions, for MCS charging stations. The overvoltage protection is triggered, for example, by lightning strikes or overvoltage in the power grid. An additional fuse that comes already pre-installed is also part of the unit – normally, this has to be designed and installed separately. DEHNguard enables a simpler, more compact and more cost-effective charging unit set-up and also saves on development costs. The system is already designed for the upcoming IEC 61643-41, but also complies with the IEC 61851-23:2023 that is currently in force. (Booth A3.120)

▶ *https://www.dehn.de/de*

Hive Power FLEXO Smart Charge by Hive Power SA

Hive Power FLEXO Smart Charge is an innovative SaaS solution that aggregates electric vehicles and other electrical assets into one virtual power plant. AI-optimized and intelligent use of V1G and V2X enables true smart charging that not only maximizes economic viability, it also achieves significant CO_2 savings. The platform enables balancing energy to be offered directly via vehicles, optimizing flexible assets such as electric vehicles, stationary batteries and solar systems. With an intuitive user interface, FLEXO Smart Charge sets new standards in transparency and user experience, helping to save additional costs. The hardware-independent solution helps to increase the profitability and adoption of electric vehicles, reduce total cost of ownership and avoid unnecessary grid expansion costs for grid operators. By optimizing the charging process of electric vehicles, FLEXO Smart Charge not only promotes gentle grid operation but also supports the use of renewable energies, thus making a significant contribution to a sustainable energy supply. (Booth B5.490)

▶ *https://www.hivepower.tech/*

No Thermal Propagation Technology by SAMSUNG SDI

Compared to LFP (lithium iron phosphate) cells, cells with NMC chemistry (nickel manganese cobalt) are considered to be significantly more sensitive to thermal runaway. If a cell is damaged or heats up significantly (thermal propagation), the neighboring cells are usually also affected and, in turn, heat up significantly. Samsung SDI has now introduced a hardcase format battery concept for NMC cells, known as "No TP Technology", which is designed to minimize the effects of thermal propagation. The concept primarily consists of cells with a pressure relief valve on the top, as is common with hardcase cells. The hot gas escaping from there is conducted through insulation on the battery cover, which in turn is designed to prevent the battery cover from burning through, to venting openings in the battery housing. Special insulation between the cells prevents the transfer of heat to neighboring cells. If a thermal runaway or thermal propagation is detected, the cooling system is also activated to cool the battery as much as possible. This is done via a cooling plate on which the cells stand. The effectiveness of the system has been proven through testing. (Booth C3.310)

▶ *https://www.samsungsdi.com/*

O.Motion Series by OPES Solar Mobility GmbH

OPES Solar Mobility presents the O.Motion Series, the first commercial-scale matrix solar module. Its innovative cell connection technology and material composition are specially designed to meet the challenges of vehicle applications. The unique matrix technology ensures high efficiency, vibration resistance and optimal performance in partially shaded conditions and limited space. It also allows for a larger solar cell area per square meter compared to other connection methods, thereby increasing module efficiency. The new design increases the energy yield under partial shading conditions by up to

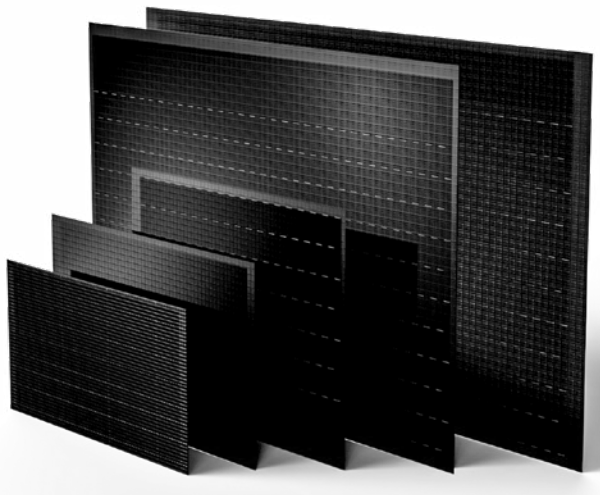


photo: OPES Solar Mobility

The O.Motion Series is the first commercial-scale matrix solar module.

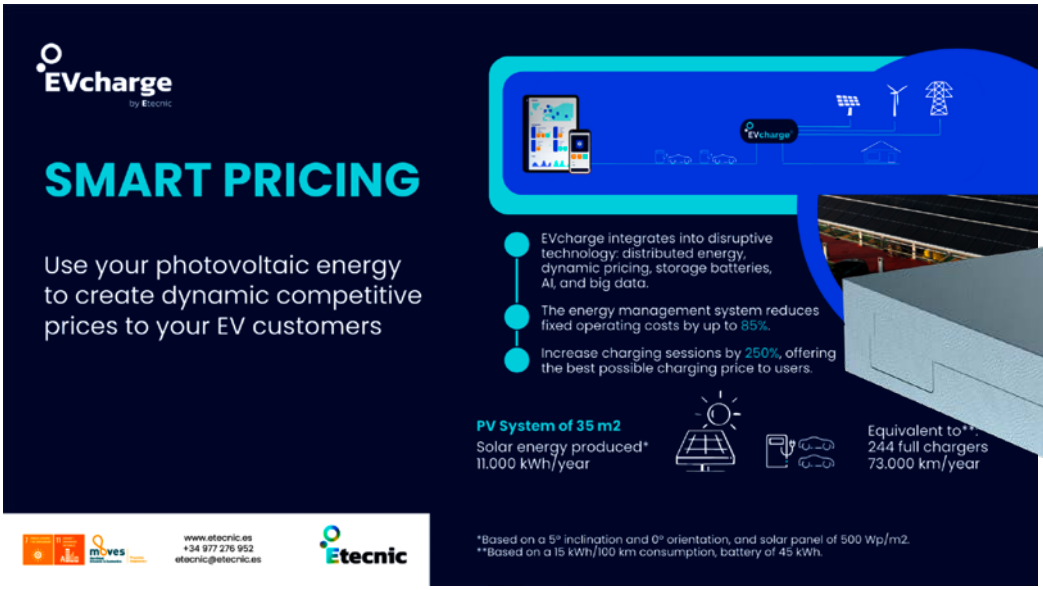


photo: Etecnic

Etecnic's EVcharge Software-as-a-Service (SaaS) platform offers new smart pricing feature.

photo: Kehua Tech

The EV3102-040K-HR-UC SiC charging module from Kehua Tech boasts an outstanding energy efficiency of up to 97 percent.

90 percent compared to conventional solar modules. In combination with the OPES CHARGE CONTROLLER, OPES Solutions offers a fully integrated system that provides flexible, lightweight and durable solar solutions for campers, commercial vehicles, trailers and buses, thereby contributing to sustainability in transportation. (Booth A3.355)

▶ *https://opes-mobility.com/*

Smart Pricing by Etecnic

Etecnic's EVcharge Software-as-a-Service (SaaS) platform, with its new smart pricing feature, enables CPOs to monitor and manage their charging stations through a single, backend system platform. Renewable energies (RE) cause significant fluctuations in electricity prices on the electricity market, which is why it is traded on day-ahead or intraday markets. This is in contrast to the usually fixed (and usually comparatively high) electricity prices that electric vehicle users experience at charging stations and customers do not currently benefit from the fact that the feed-in of renewable electricity sometimes actually results in very low electricity prices. It is possible, however, that electric car customers will charge their vehicles at precisely those times when electricity is relatively expensive. Etecnic's smart pricing module calculates the end customer's electricity price based on a variety of conditions. These do not only include renewable energy generation, but also expected customer demand and the utilization of any backup batteries that may be located at a charging park. "Smart Pricing" enables end customers to take advantage of dynamic electricity prices. The module is free of charge for operators. (Booth C6.776)

▶ *https://evcharge.net/*

URBANROOF by Friedrich GmbH

In some regions of Germany and France, it is mandatory for certain parking lots to have PV systems on their canopies. In other regions, such as Lower Austria, such PV systems are subsidized at the very least. But these installations are becoming increasingly popular, even without these incentives. The URBANROOF from Friedrich GmbH boasts a resource-conserving, wooden design. Furthermore, the PV yield is maximized by also covering the access roads. The number of columns has been kept to a minimum to keep the number of obstacles blocking parking spaces and access roads as low as possible. Another advantage is the clear height – at over 4.20 meters, even high-roofed vans can pass underneath the canopy. The company claims capacities of 5 kWp per parking space. The URBANROOF is available for parking areas with 10, 20 and 40 spaces, with a capacity of 52 to 200 kWp. (Booth C5.171J)

▶ *http://www.friedrich-ideenschmiede.de/*

Vela Series Residential Solar Carport by GoodWe Europe GmbH

The Vela Series Residential Solar Carport from GoodWe is an innovative solution in the field of solar carports. It offers a watertight canopy with standard photovoltaic modules. A special frame design allows the modules to interlock along the rows. Mechanical overlap between the gaps, similar to roof tiles, provides an effective seal. This is achieved without the use of special, often plastic-based sealing methods. The modular aluminum structure of the carport allows for easy on-site assembly. No heavy machinery is required, reducing logistics and installation costs. The all-in-one package simplifies the process for distributors and installers, and offers end customers a single point of contact for warranty claims. The reduced utilization of materials also promotes sustainability. The combination of cost efficiency, ease of installation and advanced technology makes the Vela Series a scalable solution for energy-producing carport systems. (Booth B4.109)

▶ *https://emea.goodwe.com/*

photo: DEHN

The DEHNguard M DC ACI 1250 FM ist a type 2 power protection switch with integrated overvoltage protection for DC charging stations.

The smart integration of clean energy in the supply system gains importance.

photo: Heiko Schwarzburger

Integration: Be smart, be safe

The smarter E Award ■ The products and solutions in the Smart Integrated Energy category impressively illustrate the diversity and complexity of clean energy supply: For the energy transition to be successful, solar power must be smartly integrated into the grid, at all voltage levels.

by Heiko Schwarzburger

The complexity of the energy transition is growing with the diversity of products, solutions, and applications. Likewise, the requirements for system security against unauthorized access are growing.

COMBI-PRO-MAX by Toscano

If end customers also want to use their residential storage systems as a backup in the event of a power outage, it is necessary to disconnect it from the public power grid when in backup operation. Manual switches are typically used in the home for this purpose, as automated solutions require several controllable switches. This results in high costs due to the extensive wiring required, which is usually not economical. With its COMBI-PRO-MAX, Spanish company Toscano has solved this problem. It is housed in a compact top-hat rail housing for the meter cabinet and contains the complete switching mechanism in a single device. This means that the COMBI-PRO-MAX offers a fully automated solution for switching to backup operation and back to on-grid operation. Toscano's COMBI-PRO-MAX is compatible with all standard battery inverters. (Booth B4.680)

▶ *https://toscano.es/*

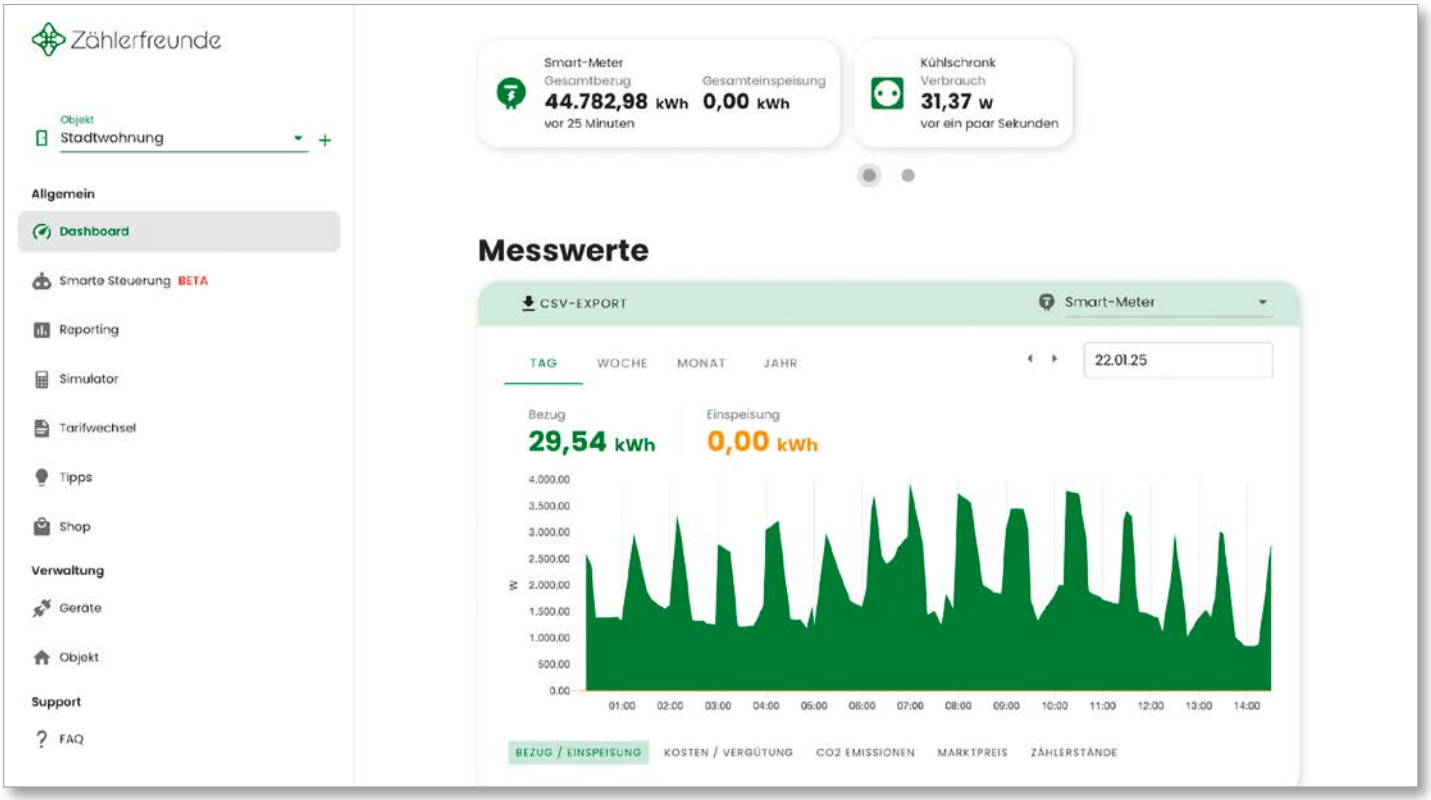


photo: Zählerfreunde

Zählerfreunde offers a white-label energy management Software-as-a-Service (SaaS) that is specifically tailored to the needs of utilities.

FEMS Energy Management System by FENECON

The trend towards smart homes and the increasing popularity of electric vehicles require intelligent energy management systems that optimize the energy flow within buildings. Fenecon's FEMS (FENECON Energy Management System) is one such solution, maximizing self-consumption of solar power and enabling the use of variable electricity tariffs. FEMS controls and visualizes energy storage systems, heat pumps and electric vehicle charging stations, ensuring that these devices are operated in an energy-efficient and grid-serving manner. By integrating AI-based forecasts and taking grid signals into account, FEMS optimizes energy consumption and helps to stabilize the power grid. FEMS is an important building block for both sector coupling and the energy transition, as it enables the smart integration of different energy consumers within a building. (Booth B1.410)

▶ *https://fenecon.de/en/*

fEnOMS by fleXality GmbH

Rising energy costs and the increasing importance of decarbonization currently pose major challenges for companies in the industrial sector. fEnOMS by fleXality is an AI-based software solution that optimizes energy consumption in industrial processes. By analyzing large data sets and real-time market data, fEnOMS forecasts energy demand and identifies cost-effective time slots for controlling cooling and heating processes. Energy-intensive tasks are scheduled for times when electricity prices are lower, which reduces costs and emissions. The software integrates seamlessly into existing control systems, allowing for automated energy management optimization. fEnOMS contributes to increasing energy efficiency in industry and to integration of renewable energies. (Booth C5.640)

▶ *https://flexality.de/en/home/*

Forecast & Investment by Utiligize ApS

The task of connecting a large number of new consumers is difficult for grid operators. Distribution system operators in particular must perform very complex asset management operations with an almost unmanageable number of operating resources and customers to be connected. Utiligize offers an integrated platform that supports grid operators in this demanding undertaking by combining classic georeferenced network data with measurements from smart meters. This data provides the basis for predicting demand on the grid, and this data can then be used for predictive grid planning. To achieve this, Utiligize uses its cloud-based solution to plan the most cost-effective grid expansion possible, taking data from existing and future resources into account. The usual grid planning criteria, such as N-1, are considered. Utiligize's offering is a solution to a globally important question that has the potential to save a lot of resources. (Booth B5.490)

▶ *https://utiligize.com/*

photo: Heiko Schwarzburger

The systems get more and more complex.

mc Assetpilot by meteocontrol GmbH

The digitalization and automation of business processes in the field of renewable energies poses new challenges for big-portfolio asset managers. meteocontrol's mc Assetpilot is a cloud-based software solution that addresses these challenges. The software enables asset managers to monitor, manage and optimize their facilities throughout their entire life cycle. Automating processes and using a central data storage system, asset managers can significantly increase their efficiency and make more informed decisions. mc Assetpilot contributes to increasing the profitability of renewable energy systems and advancing the energy transition. (Booth B5.210)

▶ *https://www.meteocontrol.com/*

Stem Cell Grid Tech by Sungrow Power Supply Co.,Ltd.

Inverters will play a crucial role in the energy system of the future. They will connect practically all power plants, consumers and storage devices to the power grid and will therefore have to shoulder corresponding system responsibility. With Stem Cell Grid Technology, Sungrow Power Supply meets grid operators' requirements and delivers a grid-forming inverter. Consequently, Stem Cell Grid Technology is equipped for grid-supporting and microgrid applications. Technologically speaking, the platform fulfills the common fault-ride-through functionalities. Moreover, its fast control supports the inherent grid control that rotating machines previously provided in the old power grid. In the future power grid, this inertia will have to be provided by inverters. It also offers grid reconstruction functionalities. With Stem Cell Grid Technology, Sungrow Power Supply offers a flexible solution for all sizes and applications. (Booth B3.310)

▶ *https://en.sungrowpower.com/*

White-Label Energy Management Software for Utilities by Zählerfreunde

The increasing digitalization of the energy industry and the growing demand for intelligent energy solutions present utilities with new challenges. Zählerfreunde offers a white-label energy management Software-as-a-Service (SaaS) that is specifically tailored to the needs of utilities. The software enables utilities to provide their customers with a user-friendly platform for visualizing smart meter data, integrating time-of-use tariffs and intelligently charging electric vehicles. The white-label solution allows utilities to offer the software under their own brand, thereby strengthening customer loyalty and attracting new customers. The software helps utilities to take advantage of the opportunities offered by digitalization and to offer their customers innovative energy solutions. (Booth C5.750E)

▶ *https://www.zaehlerfreunde.com/*

photo: toscano

COMBI-PRO-MAX switches easily in case of power outage.

photo: LONGi Hydrogen

Projects: Global change and global ideas

The smarter E Award ■ The innovations in the Outstanding Projects category demonstrate that work is being done on the energy transition all over the world. The spectrum ranges from green hydrogen and large-scale storage projects to the seamless supply of solar power for municipalities and the economy.

by Heiko Schwarzburger

Diverse technologies and business models serve only one purpose: to replace fossil-nuclear energy generation with clean energy everywhere in the world. Clean and afforda-ble, as these special projects demonstrate.

3000 Nm^3/h Electrolyzer in Hydrogen-Rich Blast Furnace Smelting by LONGi Hydrogen

In an industrial application, carbon is being substituted for green hydrogen during blast furnace smelting in Chinese Qinhuangdao. This project is an excellent example of how a step – that is often propagated worldwide – toward the decarbonization of chemical processes is being implemented on a large scale. The largest electrolyzers currently available are being used. The two units each have a capacity of up to 3,000 Nm^3/h, making the system the world's largest commercial green hydrogen production facility. Thanks to the use of hydrogen, this industrial decarbonization reduces carbon dioxide emissions by between 8 and 11 percent. The low power consumption of 4.2 kWh/Nm^3 improves the economic viability of green hydrogen. This means that a hydrogen-enriched blast furnace smelting process is not only capable of considerably reducing emissions, but also of becoming a highly cost-effective technology. This process offers a wealth of opportunities, in particular when it comes to sustainable transmission in the steel industry. (Booth A2.170)

▶ *https://www.longi.com/cn/*

BeCool: Cooling for markets in Kenya by Phaesun

Solar-powered cold storage rooms provide marketplace distributors on Lake Victoria with the opportunity to protect their agricultural products against high temperatures. Conventional cooling methods are hard to come by due to a lack of infrastructure and insufficient power supply. So this renewable solution, which is available on a rental basis, offers even small market players and farmers access to cooling without the need to make investments of their own. They gain access to cooling devices via a Cooling-as-a-Service model (CaaS), whereby individual boxes in the cold store are rented out to market distributors. The CaaS model is organized via a dedicated app. The shaded cold storage rooms, which are manufactured on site in Kenya, feature a built-

photo: Sungrow Hydrogen SCI

This project features a combination of PV power, hydrogen, redox flow energy storage and heat storage.

in photovoltaic installation that powers a self-chill ice storage system. This system uses a natural refrigerant, recycled materials, renewable raw materials and pre-cooling via charcoal water evaporation. (Booth A4.233)

▶ *https://www.phaesun.com/home.html*

Beijing Siyuanqiao Integrated Charging Plus Storage Station Project by Beijing HyperStrong Technology

Using renewable energy in mobility can save very large amounts of CO2 when compared to the use of fossil fuels. However, integrating high-output charging stations into existing grids remains particularly challenging. 15 charging stations with integrated storage units, capable of charging up to 30 electric vehicles at the same time, were installed within the scope of this project in Beijing. Each of these units consists of two compact charging stations. The technology used here helps to ease the burden on the 10 kV distribution system, which has reached its limits due to the rapid rise in electric vehicles in China. The energy storage systems enable peak shaving during daily charging peaks, thereby reducing the load on the grid. (Booth B1.519)

▶ *https://www.hyperstrong.com/*

BiFlow by Karlsruhe Institute of Technology

Within the scope of the BiFlow project, a new type of hybrid storage system was built in a dormitory for students and trainees in Bruchsal. The system combines two different storage devices: a lithium-ion battery and a vanadium redox flow battery (VFB). A smart energy management system is used to control the use of the two storage devices to optimize overall efficiency. The lithium battery is primarily used for shorter peak loads, while the redox flow battery handles the longer storage times. The waste heat tanks of the redox flow battery are also used as hot water storage tanks, thereby dispensing with the heat storage tank usually otherwise required. In BiFlow, a thermal coupling module recovers the heat generated by the operational losses of the VFB's electrolyte tanks. By adjusting the electrolyte composition of the VFB, the electrolyte can remain stable at raised temperatures of up to 50°C during the time required to charge/discharge and for the heat exchange to take place. (Booth B0.230)

▶ *https://www.batterietechnikum.kit.edu/*

Chile's High-Voltage Substation Peak-Shaving Energy Storage Project by Xiamen Ampace Technology Ltd.

This energy storage project, integrated into a high-voltage transformer station, is ensuring stable power grid operation in a region of Chile at risk from earthquakes. It integrates renewable energy, while also optimizing grid load management. Reducing power outages caused by grid fluctuations by around 80 percent has granted 200,000 inhabitants of the Andes region access to a considerably more stable electricity supply. This also reduces the demand for coal-fired power generation by around 12 GWh every year. Grid operators are seeing a reduction in costs for peak demand switch-off by 30 percent, which saves around 1.2 million US dollars a year in grid overheads. Seismic loads pose a particularly big challenge for this project. To withstand these conditions, simulation techniques for fatigue damage are used to predict and optimize resilience against smaller seismic events, resulting in performance deterioration of less than 10 percent over the entire life cycle. (Booth C2.430)

▶ *https://www.ampacetech.com/en/us/index*

Dynamic Solar-Powered Off-grid Cooling for Island Fishery Communities by GIZ Indonesia

In the Solar Ice Maker project, up to 1.2 metric tons of block ice are produced off-grid using solar energy on a daily basis. The idea behind it is to provide smaller fishing communities with access to improved cold chains, with the aim of helping them gain better market access and, in turn, generate a higher income. A further benefit is that more continuous cooling also goes a long way toward helping avoid food losses. The system requires around 100 kWh to produce one metric ton of ice. A heat storage tank (brine) combined with a 24 kWh battery storage system ensures continuous ice production. The con-

photo: CyberGrid

The Theiss hybrid power plant consists of a thermal large-scale storage system, and an electric storage system.

photo: Phaesun

This renewable solution is available on a rental basis. It offers small market players and farmers access to cooling.

photo: Xiamen Ampace Technology

This energy storage project ensures stable power grid operation in a region of Chile at risk from earthquakes.

trol system automatically adjusts ice production according to solar irradiation levels, the state of charge of the battery and the brine temperature by varying the compressor frequency. (Booth A3.654)

▶ *https://www.giz.de/en/worldwide/352.html*

Low carbon institute green hydrogen demonstration project by Sungrow Hydrogen SCI. & Tech. CO., Ltd.

This project features a particularly complex combination of different technologies and is a prime example of how renewable energy can be integrated, stored and converted using an intelligent approach. This project features a combination of 10 MW PV power generation, 1,200 Nm^3/h hydrogen production, 1.5 MW/6 MWh vanadium redox flow energy storage and a 2 MW/10 MWh high-temperature heat storage tank. The scientifically backed project underpins research into key technologies capable of providing both renewable energy and raw materials. The chemicals industry in particular is set to benefit from this during the transformation toward an emission-free future. Supplying chemical production facilities with, for example, hydrogen, oxygen, electricity and steam that is produced using an environment-friendly approach is set to highlight a crucial step in the industry's green development. (Booth B3.310)

▶ *https://en.sungrowpower.com/*

Rooftop PV systems in 405 public schools in Cyprus by Electricity Authority of Cyprus

Commissioned by the Ministry of Education, photovoltaic installations with a combined output of 4.9 MW have been built in a total of 405 schools in Cyprus. All public schools that met the relevant technical criteria were eligible for a solar installation. The size of the PV systems was adjusted based on the energy consumption of each school. As part of the installation process, thermal insulation on the school roofs was also improved, with heat insulation being applied to a total area of 83,500 m2. These measures enabled the schools to reduce their energy consumption by around 30 percent. For the ministry it was vital that the project was highly visible to raise awareness, particularly among the younger generation, about the use of renewable energy and energy-saving measures.

▶ *https://www.eac.com.cy/*

Santanghu 250MW/1000MWh Energy Storage Project by Beijing HyperStrong Technology Co., Ltd.

An energy storage system with an output of 250 MW and a storage capacity of 1,000 MWh, making it one of the world's largest battery storage units to date, has been built just over 50 kilometers away from the Chinese city of Santanghu. Connected to it is a 1 GW wind farm, where 81 units consisting of lithium-iron-phosphate (LFP) batteries of varying power classes span an area of almost six hectares. In conjunction with renewable sources of energy, the storage system improves grid stability. The site is located around 1,000 meters above sea level with a harsh climate characterized by large seasonal temperature differences of between -27°C and +38°C, making both cooling and heat management a major challenge. (Booth B1.519)

▶ *https://www.hyperstrong.com/*

Theiss Hybrid Storage System by CyberGrid GmbH

This project is an excellent example of how implementing renewable energy-based sector coupling can be achieved in a municipal environment. The hybrid power plant consists of a thermal large-scale storage system with an energy capacity of 5 MWh, and an electric storage system with an output of 5 MW and an energy content of 6 MWh. To lessen the impact of overcapacities in renewable energy generation, photovoltaic electricity can be stored in batteries or used to heat water, which is then fed into the Lower Austrian district heating network. The thermal large-scale storage system has a capacity of 50,000 m^3, making it Austria's largest district heating storage system. The battery storage system keeps the grid stable by balancing out fluctuating generation from renewable sources of energy. If there is excess energy in the power grid, an electric heating system is activated. If demand is higher than generation, energy is drawn from this system. If heating demand is lower, energy is temporarily stored in the district heating storage system. (Booth B5.490)

▶ *https://www.cyber-grid.com/*

LUXOR SOLAR

Transparent double glass module Eco-Line

photo: Luxor Solar

Luxor Solar presents the new Eco-Line series. The bifacial double glass module is the manufacturer's first solar module with general building approval (abZ) in accordance with DIN 18008 and has been tested by the German Institute for Building Technology (DIBt).

This means that the solar module Eco-Line Secure Glas-Glas Bifacial has been specially approved for overhead installations and for use as a façade solution on buildings and promenades.

The robust glass-glass construction ensures high stability and durability, even under extreme environmental conditions. The transparent solar module has 108 half cells in a special glass-glass architecture with a 40 millimeter thick aluminum frame in the tail. The premium solar module has an output of 395 to 415 watts and a transparency level of seven per cent. The Eco Line Secure series thus opens up new possibilities for solar technology in the construction industry.

▶ ***https://www.luxor.solar/en***

AIKO

Next generation of ABC modules

Module manufacturer Aiko has launched its Gen 2 N-type ABC (All Back Contact) modules. To be precise: the Neostar, Comet and Stellar series. With these, Aiko aims to set new standards for solar yields in both private and commercial applications.

The features of this new generation of these back contact modules include innovative approaches to optimising behaviour in the event of partial shading. Tests by TÜV Nord show that the ABC modules deliver 30 per cent more power than conventional technologies, even with a completely shaded cell.

According to the manufacturer, the new ABC modules also have the advantage of temperature limitation: a reliably lower module temperature enables higher efficiency and reduces the risk of fire. In addition, the modules offer other features such as an improved temperature coefficient of minus 0.26 per cent per degree Celsius, lower degradation of less than one per cent in the first year and 0.35 per cent annually up to the 30th year of operation.

photo: Aiko

▶ ***https://aikosolar.com/en/***

FUTURASUN

Silk Nova modules for the Guggenheim in Bilbao

The unique silver module is already famous thanks to an installation on the roof of Bilbao's Guggenheim Museum. Now, Italian manufacturer FuturaSun is presenting a successor with new output, dimensions and colour.

Silver-coloured modules have many areas of application where photovoltaics must be integrated unobtrusively into the architectural setting. The new Silk Nova Silver with a new higher output and an emphasis on aesthetics enables optimum colour integration of the photovoltaic system on modern and listed light grey roofs and metal roofing.

The glass-foil module consists of 96 half cells with n-type technology and has an output of 390 watts. The module measures less than two square metres (1762 x 1134 x 30 mm). The new FU390M Silk Nova Silver will be available from the end of April 2025.

▶ ***https://www.futurasun.com/de***

photo: FuturaSun

GRIDPARITY

Bifacial double-glazed module for Agri-PV

photo: GridParity

GridParity's new B80 bifacial module has been specifically designed and optimised for agricultural applications. With 45% transparency, it provides an ideal balance between power generation and light transmission, allowing plants to grow optimally under the system.

The modules can therefore be used flexibly from berry and fruit plantations to special crops. The module has a power output of 320 watts and uses bifacial M10 cells to ensure good yields. This allows additional light reflections to be used. The robust double-glazed design increases durability and weather resistance.

The module is a perfect fit for GridParity's Agri-PV systems. It offers farmers an economically attractive solution for combining agriculture and solar power generation.

▶ ***https://www.gridparityag.com***

BMZ

Commercial storage system to charge up to 300 kilowatts

photo: BMZ Group

Storage system manufacturer BMZ presents the Power Bloxx outdoor container solution for commercial customers. The storage unit enables small commercial enterprises to achieve a high degree of self-sufficiency from the electricity grid. However, the solution is also interesting for larger residential complexes with their own large solar system.

The Power Bloxx from BMZ is easy to install via plug and play and comes with an integrated inverter. The storage modules supply 68 to 204 kilowatt hours of electricity with an output of 50 to 300 kilowatts. The device is equipped with an intelligent control and monitoring system and also serves as an emergency power generator with a long runtime.

The storage unit comes in a standard ten-foot steel container. According to the manufacturer, the integrated air conditioning system enables operation in the usual European temperature range for use in both summer and winter. The areas of application range from coastal areas to high altitudes in mountainous regions.

▶ *https://www.bmz-group.com/*

photo: Sungrow Power Supply

SUNGROW

Large storage system uses AI and liquid cooling

Chinese manufacturer Sungrow is launching the Powerstack 200 CS commercial storage system on the European market. The energy management system (EMS) is equipped with an intelligent algorithm.

By deep learning the data, this system from Sungrow quickly develops strategies to maximise revenue. This facilitates the seamless integration and operation of photovoltaic systems, energy storage systems and charging facilities. It also supports synchronised strategies. According to the manufacturer, this leads to improved peak load coverage and efficient demand management.

The Powerstack 200 CS is equipped with an intelligent second-generation temperature control system for liquid cooling. It ensures a temperature difference of just two and a half degrees between the cells. This innovative technology extends the service life of the system by up to two years and improves energy efficiency at the same time. The system therefore achieves a cycle efficiency of over 90 per cent. This means that it can discharge an additional 4,500 kilowatt hours per year.

▶ *https://en.sungrowpower.com*

SOLAREDGE

AI platform optimises commercial storage

Solaredge presents the One platform for commercial and industrial applications. It was developed as the company's first optimisation platform for project planners (EPCs), technical service providers (O&M) and companies.

SolarEdge's One automatically manages the energy production, storage and consumption of an installation. This enables companies to achieve energy savings by using real-time data analyses and making intelligent decisions on this basis.

The platform provides in-depth performance analyses for the entire solar installation down to module level. It is also designed to help EPCs and O&M teams minimise downtime and reduce site visits. Included are functions such as: Remote maintenance, device operation and remote configuration.

The platform's live alert system enables a proactive response to critical issues to prolong system performance. The platform comes as a complete ecosystem for the control and management of solar installations - including storage units, charging stations and building systems.

▶ *https://www.solaredge.com/en*

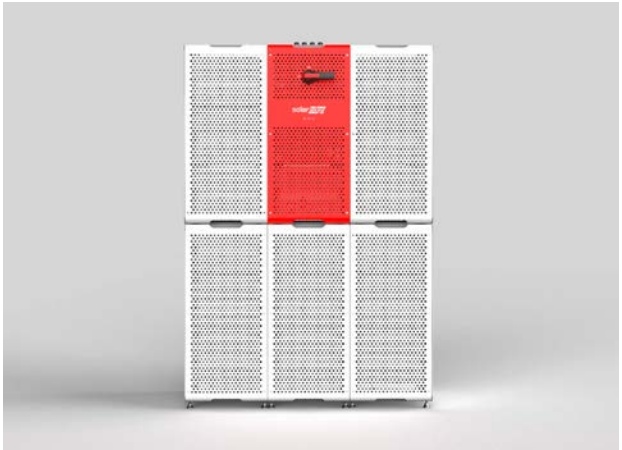


photo: SolarEdge

FENECON

Storage system with up to 66 kilowatt hours

The Fenecon Home 10 is a modular storage system for single and multi-family homes with an output of ten kilowatts. The home storage system helps owners to achieve the highest possible degree of self-sufficient power supply.
The capacity of the Fenecon Home 10 starts at 8.8 kilowatt hours and can be increased to 66 kilowatt hours. Two kilowatt hours of usable capacity are always added per module.

Together with three hybrid inverters, the new version of the home storage system will in future offer six, ten or actually 15 kilowatts of power (with DC connection to the solar system). The larger systems each have 3 MPP trackers.
Thanks to the integrated open source energy management system (FEMS), dynamic electricity tariffs can also be integrated independently of the provider in order to minimise energy costs. The three-phase storage unit is capable of emergency power supply with solar recharging and has black start capability after a power outage.

▶ ***https://fenecon.de/en/***

photo: Fenecon

TRINA SOLAR

Energy storage with advanced cooling technology

photo: Trina

The Elementa 2 energy storage systems from Trina Storage offer a highly integrated solution for modern energy needs. Housed in 20-foot containers, these systems are equipped with an advanced cooling system featuring a bionic design, ensuring a minimal temperature variation of just 2.5°C. This precise temperature control is critical for maintaining the system's longevity and efficiency, which is evidenced by its impressive 12,000-cycle lifespan and zero degradation during the first year of operation.

With system voltage capable of reaching up to 1,500 V, the Elementa 2 is designed to handle high-demand energy applications. The in-built battery modules, crafted to IP67 standards, provide robust protection against adverse environmental conditions, ensuring reliable operation even in challenging settings. Trina Storage's Elementa 2 represents a significant advancement in energy storage technology, offering a reliable, efficient, and durable solution for large-scale energy needs.

▶ ***https://www.trinasolar.com/sites/en-glb/storage/***

SOCOMEC

New modular commercial storage system

The French storage manufacturer Socomec has presented a new complete solution for commercial applications. The capacities of the modular system can be scaled from 250 kilowatt hours to three megawatt hours, with outputs ranging from 150 to 750 kilowatts.

Socomec has thus developed a new solution for storing green electricity, charging EVs and for use in off-grid systems. Thanks to peak load optimisation, the new storage unit can also be used to reduce energy costs in commercial and industrial buildings. Solar modules with an output of up to 300 kilowatts can be connected directly to the storage system. Anyone who connects the IOT-capable system to their own cloud can also monitor and control their system remotely.

Batteries and inverters are now even easier to integrate into the system and the connection to the busbars is simpler, according to the manufacturer. With the third outdoor storage generation, the manufacturer claims to have made the integration of batteries and inverters 25 per cent more compact.

▶ ***https://www.socomec.co.uk/en-gb***

photo: Socomec

WINAICO

Topcon solar module with 515 watts

photo: Winaico

Manufacturer Winaico presents a new Topcon solar module with 515 watts of power. The WST-515NHX54-A4 is based on heterojunction technology. The HJT technology enables higher energy production.

With a module efficiency of 23.2 per cent and a weight of 27.4 kilograms, it offers a compact and efficient solution for energy generation. The dimensions are 1,960 x 1,134 x 30 millimetres. The frame is made of black anodised aluminium, which is aesthetically pleasing and very robust. In addition, the 2 x 2 millimetre tempered glass with anti-reflective coating protects the cells from environmental influences and maximises light transmission.

With this module, Winaico offers a product guarantee of 25 years and a linear performance guarantee of 30 years. This promises that at least 90.3 per cent of the original output will be retained after this period. The new Topcon module will be available from April.

▶ *https://winaico.com*

CATL

Liquid-cooled storage units

photo: CATL

The EnerC liquid-cooled system from Chinese manufacturer CATL is an integrated storage solution with an innovative cooling system.

The cell-to-pack solution, also known as CTP, combines the liquid-cooled battery system with a temperature spread between the cells of a maximum of up to five degrees Celsius. In addition, the system is an emergency power supplier integrated with a fire extinguishing system and a control system compactly packaged in a container.

The lithium iron phosphate-based cells used are classified as very safe and are designed for a service life of 1,200 cycles. With independent liquid cooling plates, the EnerC ensures reliable operation of the entire system for 20 years, the manufacturer promises.

▶ *https://www.catl.com/en/ess*

FRONIUS

New Reserva DC storage system

photo: Fronius

The new DC storage from Austrian manufacturer Fronius fills an important gap in its product portfolio, making it a complete system provider. The Reserva is a high-voltage battery that provides almost loss-free charging and discharging power. Capacities of between 6.3 and 15.8 kilowatt hours are possible with two to five modules.

The storage modules are stacked on top of each other like building blocks without the need for cabling as a plug-and-play connection. A total of up to four battery towers can be connected in parallel, thus buffering 63 kilowatt hours of electricity.

The Reserva is capable of emergency power and black start. The cells of the new battery storage system are made of lithium iron phosphate, a cobalt-free material. The batteries are long-lasting, low-maintenance, safe and lightweight. The battery fits into narrow cellar corridors as well as small garages.

It can generally be used at temperatures from -20 to 55 degrees Celsius and has protection class IP65, which provides optimum protection against external influences. The new battery storage system is perfectly matched to the two hybrid inverters Gen24 Plus and Verto Plus from Fronius.

▶ *https://www.fronius.com/en*

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Gentner Energy Media GmbH
Forststr. 131, 70193 Stuttgart

PO box address:
Postfach 10 17 42, 70015 Stuttgart

Editorial team
Dipl.-Ing. Heiko Schwarzburger MA
(Editor-in-chief)
Wörther Str. 1, 10435 Berlin
phone: +49 (0) 30 / 24 53 65 49
schwarzburger@photovoltaik.eu

Hans-Christoph Neidlein
(Senior Editor)
neidlein@pveurope.eu

Advertising management
Bettina Mayer
Head of Media Sales
phone: +49 (0) 7 11 / 6 36 72-836
fax: +49 (0) 7 11 / 6 36 72-760
mayer@gentner.de

Order management
Melanie Schweigler (direction)
Rudolf Beck
Forststr. 131, 70193 Stuttgart
phone: +49 (0) 7 11 / 6 36 72-861
fax: +49 (0) 7 11 / 6 36 72-760
beck@gentner.de

Layout and design
GreenTomato GmbH, Stuttgart