SOLAR INVESTOR'S GUIDE

SIG 1/2025

ELTIF & PPA

Funding & Refinancing Solar Projects

pv Europe
solar technology and applications

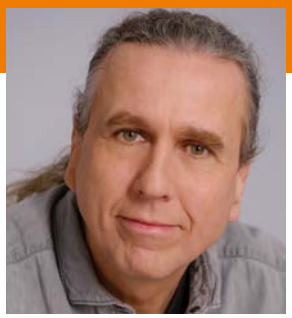

photo: MildredKlaus

Steering towards new record for corporate renewable PPAs in Europe

The year 2023 saw a breakthrough for PPAs in european solar business. The top corporate offtaker were led by heavy industry (2.9 GW), followed by ICT (2.5 GW), retail (0.8 GW), telecoms (0.7 GW), and engineering and technology (0.5 GW).

In spring 2024 corporate clean energy buyers were urging world leaders at COP28 to agree on a global target to triple renewable electricity capacity by 2030. The need is huge, time very short. You don't have to be a prophet to predict: there would also be a steep increase in 2024.

The diversification underscores the attractiveness of PPAs across industries. There was significant PPA growth amongst automotive, food and drinks, and retail companies. This trend proves that solar power plants are distancing themselves from state funding. PPAs (power purchase agreements) PPAs are independent of political upheaval, subsidies or crises.

Funds traditionally play a prominent role in financing real estate. Now the EU is opening its rules for the funds (ELTIF 2.0) to open them up to investments in renewable energies. This makes it much easier for private capital to flow into solar projects that are refinanced via PPA, for example.

As early as 2025, these two trends: financing via ELTIF and refinancing via PPA will trigger massive investments in solar power plants and large-scale storage. The energy transition is likely to accelerate. Even projects in EU countries with low GDP become attractive and financeable.

Our first Solar Investors Guide puts together the most important information for you. I wish you fruitful reading!

Heiko Schwarzburger
editor-in-chief
PV Europe & photovoltaik

PODCAST SOLAR INVESTORS GUIDE

Long-term storage with iron flow technlogy

photos: ESS/private

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***

PREVIEW SIG 2/2025

Energy Storage for the Industry and Utilities

Our next Solar Investors Guide (PDF) will look at the opportunities and pitfalls of large storage systems connected to the grid. It will be published on **February 20, 2025**.

photo: Axpo

This solar park was financed by private investors. It was planned and built by Schoenergie.

photo: Schoenergie

ELTIF offers immense investments in solar projects

European Union ■ A lot of private capital is needed to achieve the ambitious decarbonization goals. Regulatory initiatives and in particular the reform of the European Long Term Investment Fund (ELTIF) could help institutional and private investors invest significantly more in the future. The amendment to the ELTIF regime is likely to bring new impetus to the energy transition.

by Robert Guzialowski

The expansion of renewable energies is accelerating. According to the International Agency for Renewable Energy (Irena), a record 473 gigawatts of renewable energy capacity was added worldwide in 2023, 54 percent more than in 2022. The vast majority of this was due to the addition of solar systems.

However, in order to achieve the goal of tripling electricity generation capacity from renewable energies agreed at last year's UN climate summit in Dubai, a further increase in annual net expansion is required. According to international agency Irena, the power of 11.2 terawatts (TW) resulting from this target requires a total average annual increase of 1,044 gigawatts between 2024 and 2030 (inclusive).

Around 700 billion euros required

This corresponds to an average annual growth rate of 16.4 percent of the total installed electricity generation capacity from renewable energies. Photovoltaics continues to play a key role: the agency sets a capacity target of 5.5 terawatts, which requires a net increase of 578 gigawatts in each of the years from 2024 to 2030.

The associated investment requirements are enormous. In order to achieve the global goal of tripling renewable capacity by 2030, Irena estimates the global capital requirement at $1.5 trillion per year.

Around half of this goes to expanding electricity generation through renewable energies, while another 281 billion euros are needed to expand transmission and distribution networks - in Germany alone.

It doesn't work without private investors

The private sector will have to provide a significant portion of the required capital. In view of empty state coffers and high levels of debt, institutional investors such as insurance companies, pension funds, foundations, but also private investors are in demand to significantly help finance the conversion and expansion of the energy supply.

photo: Goldbeck Solar

The Wunsiedel solar park has an output power of 37 megawatts. It was built by Goldbeck Solar.

In fact, private investors' interest in investing in transforming the energy system has increased significantly. This applies in particular to investments in energy infrastructure, i.e. systems, networks and storage. Typically they run through the private markets, which include real estate, private equity, private debt, venture capital and infrastructure.

Keen interest in energy infrastructure

This interest is evidenced by the latest survey by the German Federal Association of Alternative Investments (BAI) from October 2024, according to which 57 percent of respondents plan to increase their infrastructure share in their portfolio. This makes infrastructure the most sought-after asset class in the private markets sector.

The energy subsector is perceived as particularly interesting compared to other types of infrastructure, as a survey by CFIN - Research Center for Financial Services at Steinbeis University showed last November: 90 percent of those surveyed rated the sector as (very) attractive.

Growing demand for investment opportunities

The positive assessment of infrastructure investments, particularly in the area of renewable energies, reflects the growing demand for sustainable investment opportunities. But there are other reasons for the increased interest among institutional investors.

In addition to the long-term nature, these include independence from short-term capital market fluctuations and diversification effects. In addition, infrastructure investments generally deliver stable and predictable cash flows and offer protection against inflation because the returns are linked to the general price level.

However, there is still a gap between investments made and those required. This is not least due to the regulatory framework, which, despite some efforts, has often proven to be unhelpful.

Fund opened for new business

There are currently specific plans to expand the assets permitted for open real estate special funds. In the future, the funds will also be allowed to acquire undeveloped land through participation in infrastructure project companies that are intended and suitable for the construction of systems for the generation, transport or storage of electricity, gas or heat from renewable energies. A new regulation is also intended to regulate that the operation of both open-space systems and roof-top systems is a permissible activity of the capital management company for the real estate fund.

The EU introduced the European Long-Term Investment Fund (ELTIF) back in 2015. The aim was to facilitate investments in illiquid private market investments, i.e. in unlisted investment properties, and to promote urgently needed investments in infrastructure projects by supporting institutional and private investors access via a clearly regulated vehicle.

This means that ELTIF is fundamentally predestined for investments in solar parks, wind turbines, green power grids and other projects that advance the energy transition. However, until the regulations are revised, restrictions on sales in the form of minimum investment and assets as well as restrictive rules for investment strategies have proven to be an obstacle.

Some bugs fixed

The EU has now corrected these design errors with the set of rules, also known as ELTIF 2.0. Since the new regulations, the funds are now gener-

ally open to all private investors; Minimum investment amounts and other documentation requirements no longer apply. This means that roughly the same rules apply as for open-ended mutual funds (Ucits) that invest in stocks or bonds or both. In addition, an equally high level of investor protection is guaranteed.

Private investments in the energy transition

However, there are important differences that reflect the long-term nature of private market investments. ELTIFs have a fixed term from the outset. In contrast to open-ended mutual funds, there is no provision for daily trading or early redemption of shares, although redemption options can be integrated into certain ELTIF vehicles subject to certain requirements.

This means that all private investors now have an investment vehicle at their disposal with which they can participate directly in renewable energy systems and infrastructure and benefit to the same extent from the aforementioned advantages of private market investments in general and investments in energy infrastructure in particular institutional investors.

With the ELTIF you not only have an instrument at hand that appears to be well suited for diversified long-term wealth creation. They also contribute to the urgently needed financing of the energy transition.

More investment required

In order to achieve global, regional and national climate protection goals and limit global warming, a rapid expansion of renewable energies is essential. Photovoltaics play a key role here. There is an enormous need for financing to expand solar power. A significant portion of the capital must therefore be provided by private investors.

While the regulatory environment for such investments has recently improved, especially for private investors, and demand is increasing, a continuous increase in investments in decarbonization remains necessary in order to achieve climate goals.

THE AUTHOR

Robert Guzialowski

photo: Christian Mai

has been Head of Business Development Real Assets at HANSAINVEST Hanseatische Investment-GmbH since August 2022, where he is particularly responsible for sales of private debt, private equity, renewable energy, infrastructure and real estate funds is. Previously, he was Head of Real Assets Germany at Hauck Aufhäuser Lamp Privatbank AG. In addition to sales and customer management at the AIF depository, he was responsible for supporting the capital management companies from the start of the business relationship through onboarding to fund transactions. Robert Guzialowski is a lawyer and regularly speaks and publishes on regulatory developments.

▶ ***https://www.hansainvest.de***

photo: Juwi

Juwi has a lot of experience in financing and buidling solar parks.

Joachim Goldbeck is founder and CEO of Goldbeck Solar.

photo: Robert Gross

"Negative electricity prices are a bad fit with PPAs"

Utility-scale projects ■ Joachim Goldbeck is the founder and CEO of the Goldbeck Solar Group. He analyzes the prospects for the business and assesses potential markets. In our talk he explains why he already has upcoming investments in Ukraine on his radar. **an interview**

How is the business of large solar roofs for commercial customers currently developing?

Joachim Goldbeck: *Industrial roofs are doing well, although new construction in industry is currently slowing down. We are doing well with the installation of solar systems on the roofs of existing buildings, and projects are running continuously.*

Will the demand bring more momentum to this market segment?

The demand for solar roofs will be rising, that is now clear. The supply of electricity to tenants and shared systems has also been simplified. In the case of solar roofs, our industrial and commercial customers often focus on their own consumption of solar power. The situation is different for project developers or investors who own large logistics halls. Here, feed-in is the priority. In both cases, an appropriate feed-in tariff is important to ensure economic profitability.

photo: Goldbeck Solar

Large rooftop installations are interesting business, too.

photo: Goldbeck Solar

This project was built in Belgium.

photo: Goldbeck Solar

This solar park in Chile was built by Goldbeck Solar.

How are ground-mounted solar parks developing?
The demand is enormous. We have large and well-developed projects that we are implementing. However, grid connections are becoming scarce. Negative electricity prices are also a poor fit with the Power Purchase Agreement (PPA) business model. However, there is a strong pull in this market. Major players have built up larger project pipelines.

Some analysts see major challenges for the large ground-mounted parks due to the problems you mentioned ...
We will see whether the prophecies of doom come true or whether the bulls in the market are right. Because we need a lot more solar power, for example for electrical heat supply or e-mobility. Or the growing demand for electricity due to the increasing volumes of data resulting from artificial intelligence. Electricity is becoming increasingly important in industry, for example in the production of steel.

Could large storage batteries boost the expansion of solar parks?
As an EPC, we are currently building a stand-alone battery system for a customer as pure grid storage. This can currently be presented with exciting business models, even without a solar field. But battery storage systems will also play a growing role in solar projects. Hybrids of wind and solar can make better use of grid connection points, supported by large electricity storage systems. That will come, or is already underway.

How do you see the market developing in Europe? Which countries are particularly promising?
Goldbeck Solar has been very strong in the Netherlands for years. We have very large projects on the books there, especially on open land. I expect demand to change in a year or two. We assume that agri-PV will gain in importance. We will see what is grown underneath. We call this agrivoltaics. Because the interests of farmers are taken into account, it could be easier to obtain approval for this in the future than for solar parks on greenfield sites, for example.

Which other markets are exciting for you?
Poland is just getting going again. This market stuttered for some time and was delayed. Now we have very nice projects there. We also see very good prospects in Ukraine once the war is over. We have set up a joint venture with a partner to develop this market. However, there are still a number of unanswered questions, such as federal guarantees that also cover war damage.

There is a glaring lack of electricity in Ukraine, the infrastructure has been destroyed. Solar systems should actually be the first choice for reconstruction, shouldn't they?
We started the joint venture to develop this market. So far, there are no models like PPAs in Ukraine. Private electricity traders have only been licensed for two years. Although many investors are showing some interest, it's still a lot of talk. Martial law is currently in force and the electricity grid is very unstable. Electricity sales to local companies are not permitted in euros, only in the national currency, the hryvnia. We need the risks to be hedged by politicians before any real investment can be made.

You have built many plants in the UK. What impact has Brexit had?
The UK was a strong market between 2011 and 2016. After a few weak years, we now have some good projects on our doorstep again, although many processes are definitely more complex. It is very difficult to find the right workers. In the past, many fitters from Poland or Ukraine worked in the UK, which was possible within the EU. Brexit has made this much more difficult. Taxes, customs and so on have also become more complicated.

We've seen similar ups and downs in Spain. Is recovery in sight there?
We are currently building eleven megawatts on Mallorca and 30 megawatts on the mainland. We are in talks about another 30 megawatt project. However, Spain is currently being stormed by project providers. This is causing the PPA price to fall. We have high quality standards, for example for cable technology. If only the lowest price counts in the market, the situation is not healthy. We need to identify customers who are prepared to value higher quality and longevity.

Interview by Heiko Schwarzburger.
▶ ***https://goldbecksolar.com/en/***

photo: Goldbeck Solar

In Germany, solar parks grew by 40 percent in 2024 compared to the previous year, to 6.3 gigawatts.

photo: Heiko Schwarzburger

New HQ of BayWa r.e. in Tubingen. The wholesaler expands the European business.

Prices can hardly go any lower

Specialist wholesaler ■ The solar industry cannot escape the chaos. Prices continue to fall, even though they seemed to have bottomed out. The result is tough cuts for producers. Retailers are also under pressure to streamline their processes.

by Heiko Schwarzburger

At the end of 2024, high-performance modules fell again by around one cent per watt. The solar retailer PVXchange reported a price drop of eight percent on average for all performance classes. "The sharp price slide in November could have been the last of its kind for the time being," hopes Martin Schachinger from PVXchange. "The pain threshold seems to have been reached, or even exceeded, and all signs point to a price recovery."

Every cent has a particularly serious impact given the already low prices. The price drop of around eight percent on average across all performance classes cuts deep into the manufacturers' flesh.

Everything has to go!

The manufacturers have no choice but to play along and hope for better days. They devalue the excess inventory to boost sales. Don't just sit with old goods, everything has to go!

The past year, which is slowly coming to an end, shows that this strategy does not necessarily work. Although components and turnkey systems became cheaper, demand and sales did not increase significantly. There was only significant growth in solar parks, where the low prices triggered a real euphoria. Because low prices mean better returns.

Restraint in small systems

There is currently still strong reluctance to be seen, especially in the segment of private small systems - everywhere in Europe. There is great uncertainty regarding general economic development, which is why private households are postponing their investments.

The only thing that is constantly rising is the cost of living - even when inflation is down, as are the processing times for administrations and authorities. Especially for medium to large projects, the planning lead time is often

immense. Personnel and materials must be pre-financed. The risk lies with the project developer, because the banks cannot yet do much with business models beyond the legally guaranteed feed-in tariff.

Large solar farms are doing well

The solar specialist retailer EWS also regularly analyzes monthly additions. He is active in Northern Germany, Scandinavia and Benelux. Large solar parks are doing very well, but rooftop systems are far below expectations.

Actually incomprehensible: The range of photovoltaic systems for self-consumption of self-generated solar power has never been as attractive as it is now. The systems are technically sophisticated and are more economical than they were a year or two ago, when prices for solar components were relatively high. Today prices are at their lowest, and experienced craftsmen have free capacity for new orders.

In addition, the expansion of solar storage is lagging. It also declined at the end of 2024. There is a lack of willingness to invest in battery systems, especially in private and commercial systems.

Overcapacity in the Far East

The fall in prices is due to overcapacity in the Middle Kingdom. The manufacturers of solar modules and power electronics had massively expanded their factories. Due to the economic crisis in China and the reluctance of consumers in Europe, Chinese suppliers lost their home market and the most lucrative export market at the same time.

In addition, the USA has closed the doors and tariffs on Chinese goods have driven up prices there. In fact, the only way out for the Chinese was to shut down capacity, and to squander their overproduction in Europe.

Huge losses

They cannot survive with it. Most Chinese manufacturers remain radio silent when it comes to their balance sheets. Longi is a notable exception. The group is listed on the Shanghai stock exchange, so it has to report its figures.

In the first half of the year, the company had sales of 5.03 billion euros (38.529 billion yuan). This is a bitter cut, because in the same period last year it was 8.208 billion euros (64.652 billion yuan). At the time, that was 28.36 percent more than in the first half of 2023.

Not surprisingly: the brutal price war among Chinese module manufacturers is having a disastrous effect. Longi's sales fell by 39 percent in the first quarter. At least the module manufacturer has a strategy to counter shrinking revenues: the bifacial solar module Himo 9 was brought onto the market in the first half of the year, which the competition can do little to counter.

Innovations as a lifeline

The module uses HPBC 2.0 back contact cell technology (Hybrid Passivated Back Contact Cell Technology) and has an output of 660 watts. The cells were made from the new Tairay silicon wafers that Longi produces itself.

Longi managers predict that production capacity for monocrystalline silicon wafers will reach 200 gigawatts in the next three years, of which more than 80 percent will be Tairay wafers. The annual production capacity of cells with back contact technology will reach 100 gigawatts, and the production capacity of monocrystalline modules will reach 150 gigawatts. Longi is now hoping for a "quick recovery from the volatile situation on the global photovoltaic market."

photo: Baywa r.e.

The supply chain is being streamlined and digital sales are expanding.

Markets are reviving

All hopes rest on a revival of the markets, worldwide. These hopes are not unfounded: In the first half of the year, around 102.48 gigawatts of new solar capacity were added in China alone, 30.68 percent more than the entire previous year. Two thirds of all new power plants in China are solar power plants.

China's module exports rose by almost 20 percent in the first half of the year compared to the previous year. Europe remained the largest export market for Chinese solar modules, followed by Pakistan, India and Saudi Arabia. Longi was able to increase its sales in Asia and the Pacific region by more than 140 percent compared to the previous year.

The third quarter showed only hesitant improvement. As of the end of October, Longi had sales of 58.583 billion yuan, about 20 billion yuan more than in the first half of the year. The net loss reached 1,260 billion yuan, at least 167 million euros. The loss curve flattened, but the company still has to take countermeasures. More than a third of administrative costs were reduced.

There are no module manufacturers of comparable size in Europe. Rumors about planned gigafactories for solar modules have now fallen silent. There is no trick to be won with the current prices.

Glut of inverters

However, the difficulties are not limited to modules; there is also excess capacity in inverters. Fronius and Kostal had expanded their production lines,

photo: EWS

EWS has a strong position in Northern Europe. The storage area near the Danish border was expanded to include a new hall.

now they have to face tough price competition. The Chinese suppliers of converters have the same problem as their colleagues from the module industry. And they are pursuing a similar strategy: they are pushing their devices onto the European market with competitive prices, and the goods are piling up in Rotterdam.

Europe's largest supplier of inverters is SMA in Kassel. A new Gigafactory was opened there in mid-April 2023. SMA wants to increase its production capacity from 21 gigawatts to 40 gigawatts. Above all, power electronics and system technology for large-scale solar power plants, large-scale storage and hydrogen technology will be manufactured there from 2025.

Smart investment in Niestetal

This investment turned out to be wise, as the market segment for large-scale systems is booming – globally. In contrast, demand for private systems and in the C&I segment of commercial and industrial roof systems is weakening. These inverters were canceled by the dealers and SMA had to devalue and write off larger quantities.

The company will have sales of around 1.5 billion euros this year, and management has revised its forecasts downwards several times. Around 1,100 jobs will be lost worldwide, including more than 650 in Niestetal.

The question will be whether SMA will continue to build inverters for home systems or commercial systems with lower output in the future. The tussle is particularly big there. Fronius and Kaco, for example, are looking for a way out of the crisis together: The new commercial converter Argento from Fronius is manufactured at Kaco in Neckarsulm.

Good stand in the big business

SMA is very strong – and also profitable – in the large-scale systems market. That's why the new Gigafactory comes at the right time. At the same time, the company is expanding its subsidiary SMA Magnetics in Krakow, Poland. A second factory hall for choke coils and transformers will be built there by the end of the year. These inductors are essential for the system efficiency of the power electronics.

The quality of the circuit boards is also important. They are becoming more complex, more powerful and more compact. In addition, silicon carbide is increasingly displacing silicon components in power transistors; they allow higher temperatures of up to 120 degrees Celsius, more compact devices and better efficiency. SMA is currently building a new production facility for printed circuit boards in Kassel, with around 50 jobs planned.

Suffering affects wholesalers

The suffering of the producers extends to the wholesalers. Because the drop in prices means that they have to handle a lot more goods. Larger flows of goods mean more storage space and complex processes from ordering to delivery to invoicing the goods.

Industry leader BayWa r.e. in Tubingen meets these challenges with radical rationalization and digitalization. Worldwide, BayWa r.e. has 23 subsidiaries and nine sales offices. The focus of the business is on Europe.

The number of storage locations was reduced from 68 to 48, still 320,000 square meters of space. "We will continue to concentrate the warehouses strongly," says Frank Jessel, CEO of BayWa Solar Trade in Tübingen. "We will abandon smaller locations and concentrate on larger hubs."

Profitability more important than size

For Jessel, "Profitability is more important than size." In 2023, a total of ten gigawatts of solar modules and inverters were sold. "We sold more modules in 2024," says the manager. Sales of inverters were stagnating.

However, BayWa r.e. will more than halve its inventory this year, i.e. massively reduce inventory. This eased the pressure on the balance sheet. The module stocks are now completely rotated six times a year. This means that the retailer can buy new goods at current prices every two months.

BayWa r.e has now rolled out its web shops in 25 countries, and further investments are planned. The aim of this is to streamline the process chain and make it completely electronic.

Not just the prices are worrying

It's not just the chaotic prices that are worrying. Strong competition is increasingly coming from long-established electrical wholesalers, who now also offer components for photovoltaics, power storage systems or wall boxes for electric cars. In addition, there is the small-scale online trade that offers very aggressive prices, but no service or hardly any reliable guarantees.

In Europe, BayWa r.e. around 80 percent of sales. There are around 20,000 customers in the database, around 4,000 of them in Germany alone.

BayWa r.e. is currently building is setting up a new import warehouse for solar modules in Rotterdam to accommodate the flow of goods from the Far East and quickly bring them to customers. In collaboration with the Seacon company, 50,000 square meters are being developed near a container terminal. There is also a 10,000 square meter warehouse in Tübingen. Other transshipment centers are located in Duisburg, Magdeburg and in Venlo, the Netherlands.

EWS is building a new warehouse

EWS in Handewitt on the Danish border is also increasing storage capacity. The seventh hall is under construction there. The excavators have been working in the Kätnerland industrial area since the end of May, and the project should be completed and ready for occupancy until year`s end.

The new hall will offer an additional 1,800 square meters, enough space for more than 700 pallets of solar modules and around the same number of pallets for electricity storage. In this way, EWS increases its storage capacity for solar modules by 35 percent and for battery storage by 25 percent. From Handewitt, EWS supplies all of its customers in the installing trade, who are primarily based in Northern Germany, Scandinavia and Benelux.

Direct sales without transshipment

The new warehouse will be used for direct sales to specialist tradesmen without the goods having to be reloaded on their way to the customers. "The new warehouse was planned so that we could achieve maximum efficiency," says Jan Paul Dahm, Managing Director of EWS. Hall 7 is located directly next to the other EWS halls, because short distances save money and time.

photo: Heiko Schwarzburger

New logistics properties are equipped with solar modules.

The new hall cost around 1.5 million euros. Kai Lippert, founder and managing director of EWS, says: "With this investment we are setting an example of continuity – for our customers and our employees."

▶ ***https://www.pveurope.eu/specialized-trade***

photo: Vorsatz Media

André Kremer (left) and Joel Wagner are experts for solar and wind farms.

„We combine wind, solar and big storage“

Project business ■ Steag Group from Germany has merged two former separate business units for solar and wind farms into a single unit, called Iqony Sens. What is the idea behind? Managing directors **André Kremer** and **Joel Wagner** talk about the strategy in the project market. **an interview**

The Steag Group has merged its two business units for solar and wind energy projects. Why?

André Kremer: *Putting together the two technologies is just the next logical step to transform the company from project development and EPC to one of Europe's leading IPPs. We want to combine the technologies wind, solar and storage under one roof.*

Is it a sign of the transformation process in the industry?

Joel Wagner: *If you look at Steag's history, being an IPP is basically baked into it's DNA. Transforming the renewable energy business towards the leading IPP makes sense. But how do we get there? First of all it's important to understand that both business lines, the wind business as well as the solar business, have operated very successfully across Europe.*

How many projects have you already built?

Joel Wagner: *We managed to implement an IPP portfolio of 250 megawatts in France, Germany and Italy. Now we are achieving the next logical step, which is expanding our IPP business. We are doing so by establishing two business lines under the roof of Iqony Sens. The one line focuses on the development, realization and commercialization of our own assets. And the second business line remains a very strong partner as EPC and O&M service provider for our customers in Europe.*

What effects do you expect from the merger?

André Kremer: *It's not only about synergies, it's rather completing each other. We've been very strong with the wind unit in France and Germany and also in Poland. We are very strong in the asset management, while the solar part was rather an agile developer in Germany, UK, Italy, and Spain. Putting it together means getting the most out of a project and a site. This is now of utmost importance. So not just increasing capacity, but using the most efficient technology to increase the output, base load capable, if possible, per construction site.*

How does the practical side look on the working together?

Joel Wagner: *Look, where these projects are to be. They are actually developed and erected and managed, and it goes hand-to-hand with local acceptance.*

When we look at the stakeholders, municipalities, the local off-takers, we basically have the same stakeholders we want to team up with. So combining wind and PV in the early stage of projects makes a lot of sense. Because we want to become a very strong partner not just for the project development, but also for 20, 25 years to operate these assets.

Is there also an aspect of grid security with this merger?
Joel Wagner: *The technology complement each other because we have strong wind conditions during winter times. We obviously can generate green electricity during night times from wind turbines. Solar is super strong in the summer, during day time. We manage to address the volatility. Reliable base load generation from renewables is more and more needed. It is needed if you look at the data center business, if you look at the hydrogen business to store electricity.*

What effect will the merger have on the European market?
André Kremer: *The vision is 100% clean and renewable energy. Putting these strong units together and delivering baseload energy, that puts us in the first row as one of the leading renewable energy provider.*
Joel Wagner: *Really important is to connect the generation side with the demand side. Within Iqony we are developing also our own hydrogen projects. We're developing large-scale battery storage solutions. Within Iqony, we have the ability to really connect the generation but also the demand. This is a very important blueprint for the European market.*

In which markets are you active?
Joel Wagner: *The demand for renewables is increasing. We are focusing on a very diverse footprint within Europe. We are not just focusing on Germany, but we are focusing also on markets like Italy, like UK, like France. Because we really want to connect.*

Interview by Manfred Gorgus
▶ ***https://www.sens-energy.com/en/***

PÜSPÖK/AUSTRIA

Wind power and agri-PV combined

The Austrian developer and operator of green energy plants Püspök, based in Nickelsdorf in Burgenland, has launched a photovoltaic offensive. This includes a solar park, which the company has now put into operation in Nickelsdorf. The 13-hectare agri-PV plant not only combines agriculture with solar power production. The plant is also combined with the existing Heidäcker Mönchhof wind farm.

Püspök has thus built its first hybrid power plant, combining wind power and photovoltaics. The advantage: wind power and photovoltaics complement perfectly each other in the generating structure. They can feed into the grid via one grid connection point and thus better utilise the grid capacities. To perfect this further, Püspök will be adding an electricity storage system to the hybrid power plant in the coming year. The permit for the large battery storage unit has already been granted.

The recently installed 23,000 solar modules have a total output of 14 megawatts. The agricultural utilisation is based on grazing the area with sheep. 'The combination of wind power, photovoltaics and battery storage technologies makes the Nickelsdorf project a pioneering energy transition project in Austria,' emphasises Managing Director Lukas Püspök. 'The simultaneous use of the land for organic farming shows that renewable energy, nature conservation and agriculture harmonise.'

The new agri-PV park is the kick-off for the photovoltaic offensive that Püspök is launching. It provides for the construction of further solar parks. The company plans to install an additional 400 megawatts of solar power capacity by 2026, as Lukas Püspök explains.

The next plant is already under construction. The Nickelsdorf II solar park is currently being built on an area of 53 hectares and will reach 68 megawatts upon completion. Commissioning of this plant is planned for this year.

▶ ***https://www.puespoek.at/***

CURRENT VIDEO

André Kremer and Joel Wagner of Iqony Sens: Wind and sun become one unit

CEO Talk: The Essen-based Steag Group has merged its previously separate growth areas of solar and wind power into a single business unit. Why the two units will work under one roof in the future we will find out now from CEO André Kremer and CEO Joel Wagner of Iqony Sens.

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

photo: Vorsatz Media

ON VIDEO: CEO TALK & PV GUIDED TOURS

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

photo: PV Europe

The price decline for inverters has leveled off significantly.

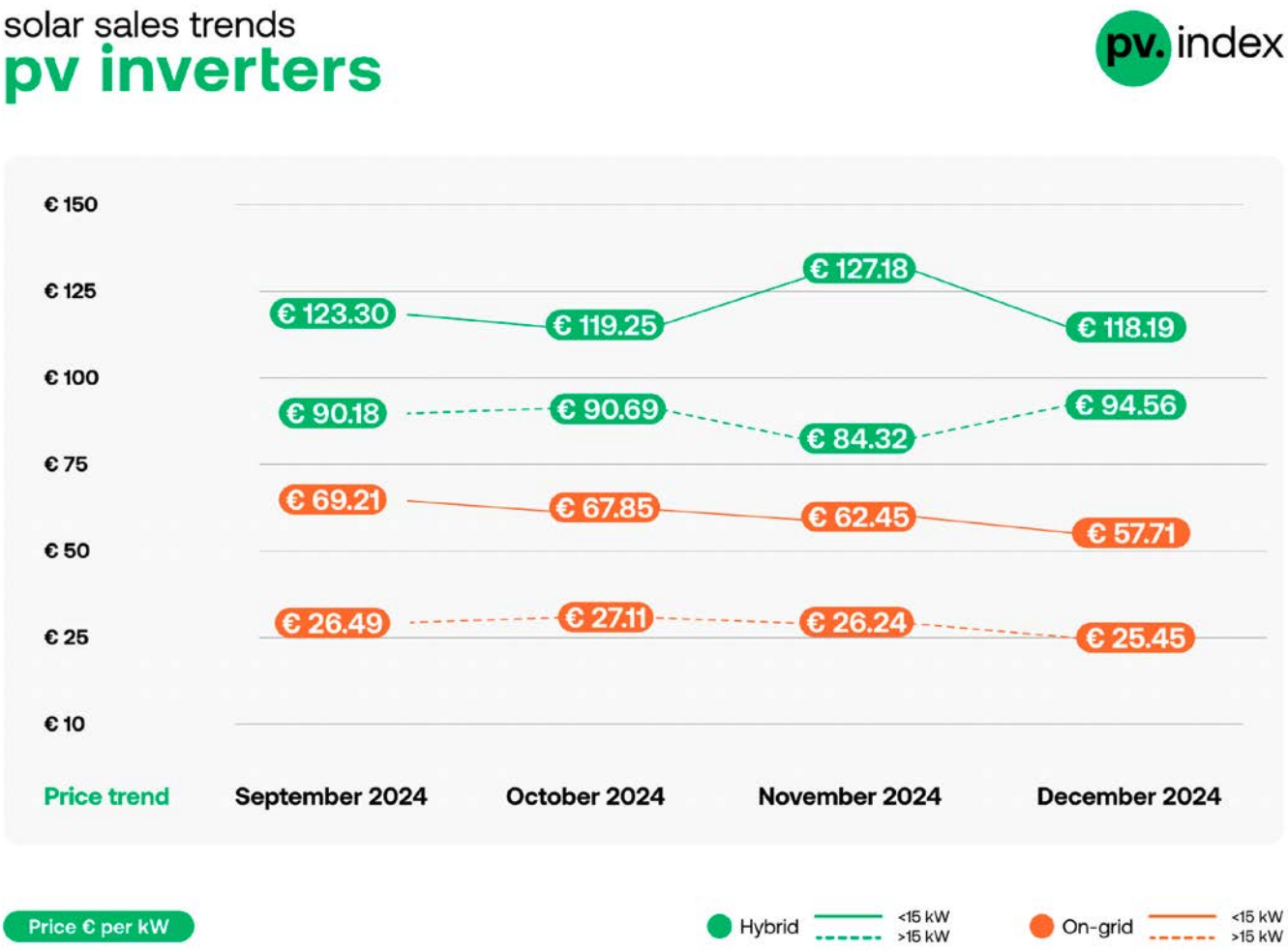


table: sun.store

Resilient market and year-end pricing dynamics

PV.index ■ The European PV market closed 2024 on a resilient note despite slight seasonal adjustments. The December edition of the PV Index of sun.store highlights continued demand stability paired with notable price adjustments in solar panels and inverters. While the PV Purchasing Managers' Index (PMI) dipped slightly to 67, the market exhibited confidence, with half of buyers planning increased purchases as they prepared for 2025. **by Hans-Christoph Neidlein**

The PV Purchasing Managers' Index (PMI) continues to be a vital tool for gauging market sentiment and demand patterns in the European solar sector. This indicator, based on purchasing intentions gathered from a sample of nearly 600 users out of more than 20,000 registered on the sun.store platform, offers a comprehensive view of the industry's current state and anticipated trajectory. By capturing input from a diverse range of participants—including installers, distributors, and other stakeholders—the PV PMI provides detailed insights into evolving purchasing behaviors across Europe.

The PV PMI for December registered at 67, reflecting a slight decline from November's 68. While the drop may appear minor, it highlights the seasonal adjustments that often characterize the solar industry during the year-end period. Factors such as holiday schedules, slowed installation activity due to winter conditions, and strategic procurement decisions all contributed to this

slight shift. Despite these challenges, the market has demonstrated remarkable stability and resilience.

Buyers remain optimistic, with 50% of respondents planning to increase purchases—a testament to the growing confidence in the industry despite external pressures. Meanwhile, 34% intended to maintain their current purchasing levels, suggesting that a significant portion of the market is holding steady, likely awaiting new projects and regulatory developments in the coming year. Only 16% of buyers anticipated reducing their orders, underscoring the ongoing demand for high-quality solar components even during traditionally slower months.

Trend of strategic planning within the industry

This balanced sentiment reflects a broader trend of strategic planning within the industry. As procurement activities adapt to seasonal dynamics, buyers are leveraging competitive pricing and preparing for an active start to 2025. December's PMI results serve as a strong indicator that the European solar market continues to thrive, supported by consistent demand and forward-looking purchasing strategies.

Filip Kierzkowski, Head of Partnerships and Trading at sun.store, commented: "The slight decline in PMI is expected during the holiday season. However, the consistent level of demand underscores the strength of Europe's solar market. December's activity indicates that buyers are strategically preparing for a robust start to 2025 by capitalizing on competitive year-end deals and securing high-quality components."

December continued the trend of falling solar panel prices, driven by intense market competition and year-end stock clearance efforts by suppliers. These price adjustments, while expected during this period, underscore the ongoing oversupply challenges within the European solar market. Buyers have taken advantage of these reduced costs to secure high-quality components at attractive rates, positioning themselves for upcoming projects in 2025.

Monofacial modules:

N-type: Prices remained steady at €0.091/Wp, reflecting a plateau in this category. This stability may indicate that the market has found a temporary equilibrium, especially for high-efficiency panels that continue to attract consistent demand.

P-type: Prices dropped significantly to €0.077/Wp, marking a notable 13% decline compared to November. This steep reduction highlights efforts by manufacturers to move older stock and remain competitive, particularly in the face of shifting buyer preferences toward advanced technologies.

Bifacial modules:

N-type: Prices declined by 5% to €0.088/Wp, as oversupply in this segment pushed prices downward. This category, often sought after for its dual-sided energy generation capabilities, continues to see pricing pressures from increased production and market saturation.

Prices experienced a 2% decline, settling at €0.088/Wp. This modest reduction reflects both seasonal dynamics and the sustained interest in aesthetically pleasing panels, often favored for residential and premium projects. The persistent price reductions across most panel categories indicate a buyer's market, where competitive pricing remains a key driver of purchasing decisions. These lower price points not only enhance the accessibility of solar technology but also pave the way for a strong start to 2025, as buyers stock up on affordable, high-quality components for new installations.

Inverter pricing: contrasting trends

Inverter prices in December exhibited diverse patterns, shaped by evolving purchasing strategies and shifting buyer preferences. These movements reflect the nuanced dynamics of the solar market as the year drew to a close, with procurement choices heavily influenced by project needs and inventory availability.

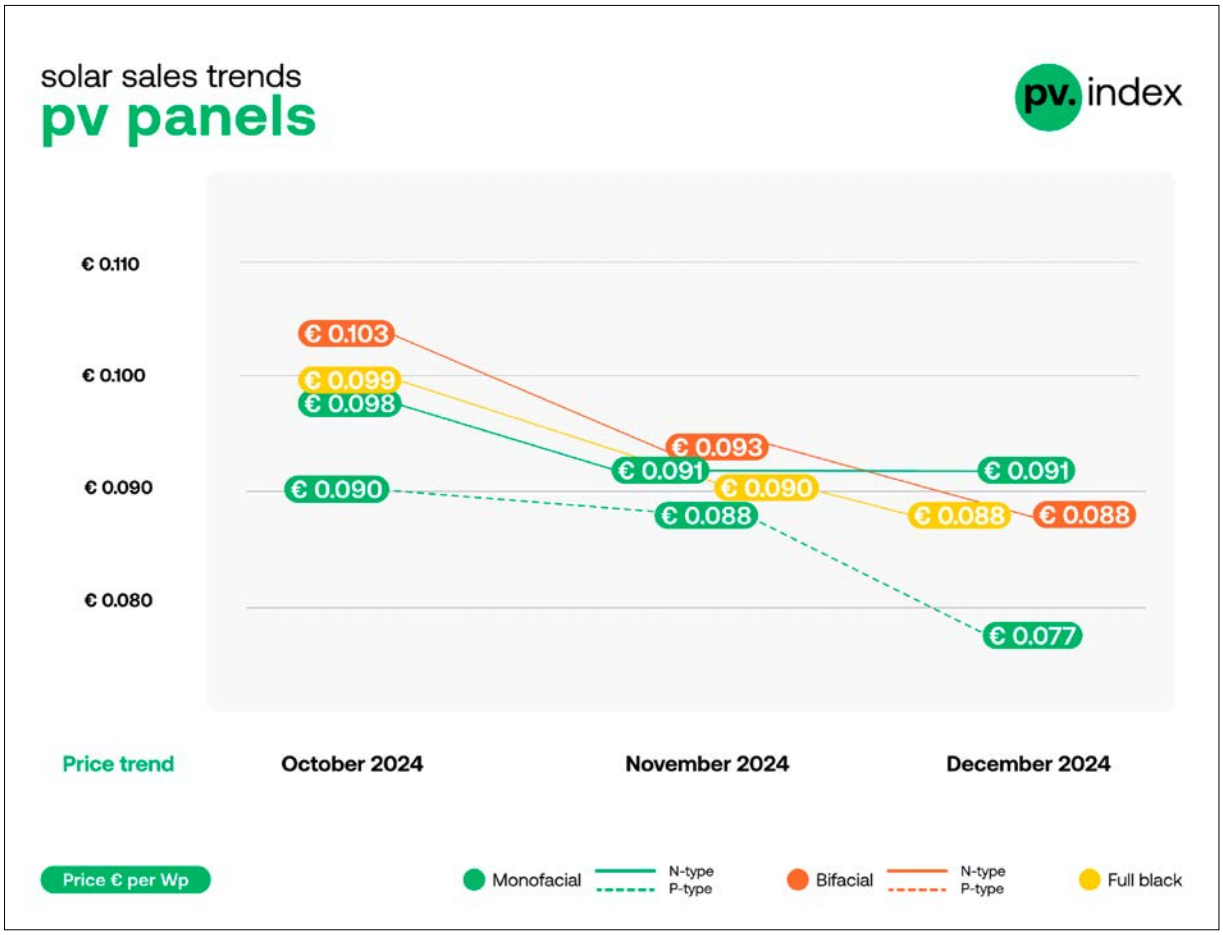


table sun.store

Solar panel prices are still under pressure.

Hybrid inverters <15kW: Prices fell by 7%, landing at €118.19/kW. This decline can be attributed to year-end inventory adjustments, as suppliers aimed to clear stock before the start of 2025. The demand for smaller hybrid inverters remained consistent, primarily driven by residential installations and smaller commercial projects.

Hybrid inverters >15kW: Prices increased by 12%, reaching €94.56/kW. This rise reflects a shift in purchasing patterns in December, with buyers focusing on mid-range systems in the 20–25kW range. The lack of bulk purchases for larger capacities, such as 50kW units, pushed the average price higher.

On-grid inverters <15kW: Prices declined by 8%, settling at €57.71/kW. This drop indicates a continued adjustment in the residential segment, where competition remains fierce, and suppliers are eager to position themselves competitively for 2025.

On-grid inverters >15kW: Prices experienced a modest 3% decline, falling to €25.45/kW. The relatively stable demand for larger on-grid systems reflects

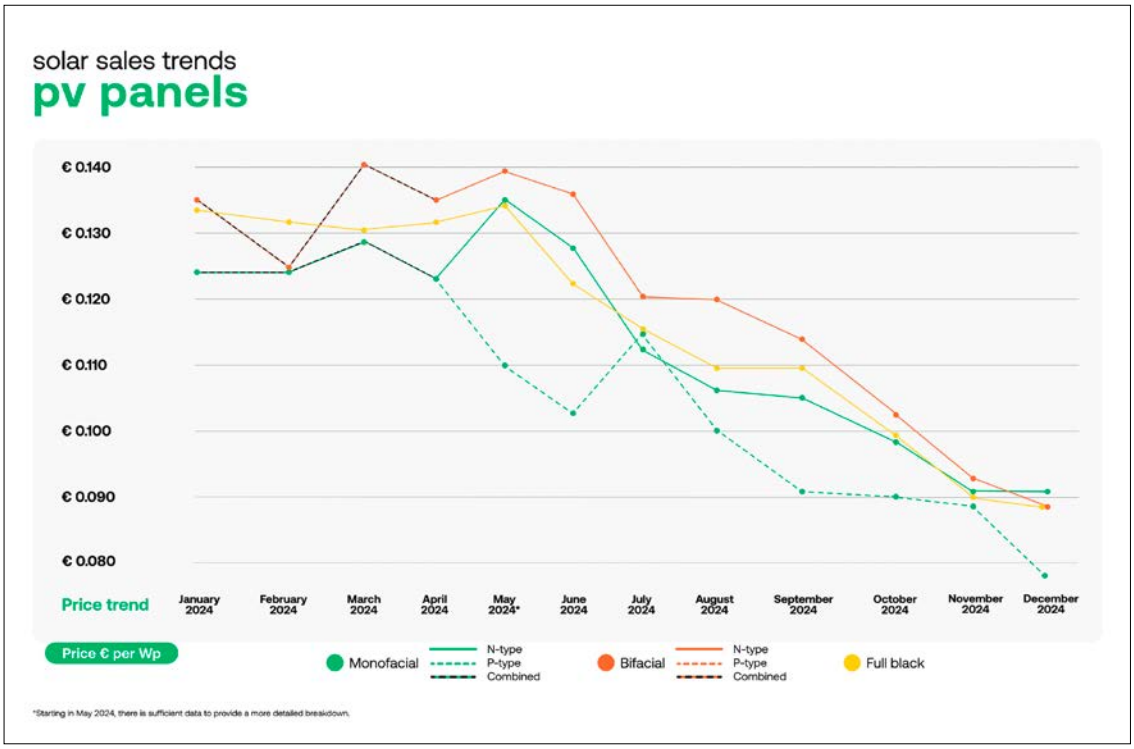


table.sun.store

Except high-efficiency N-type monofacial PV modules, the solar panels prices declined further until end of 2024.

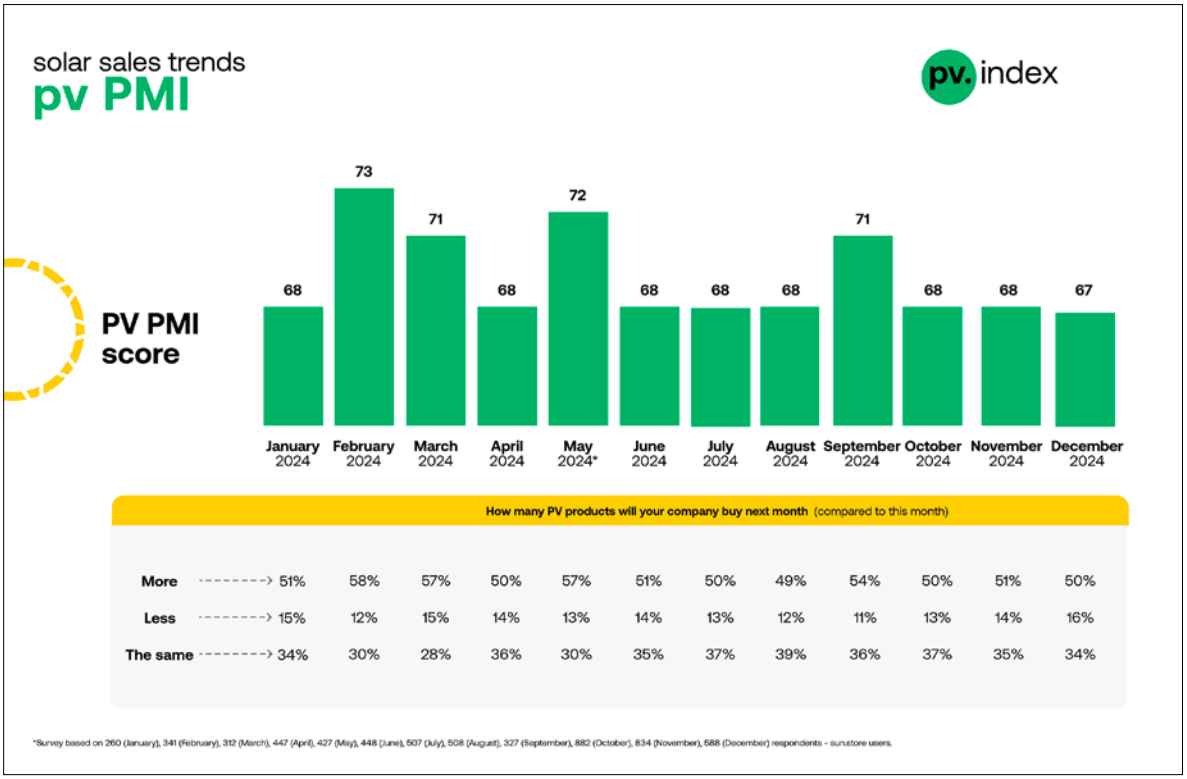


table.sun.store

The PV PMI was almost stable in the last quarter of 2024.

the sustained interest in utility-scale and large commercial installations, albeit with a cautious approach to year-end procurement.

In December, JA Solar led the panel market, favored for its reliability and efficiency. For inverters, Sungrow dominated the <15kW segment, while Huawei secured the top spot for >15kW systems, reflecting strong demand for high-performance solutions across diverse projects.

Another milestone year

As 2024 drew to a close, sun.store celebrated another milestone year, with steady demand and significant growth across European markets. The platform now boasts over 20,000 registered users, over 600 MW of components were traded in 2024, showcasing the accelerating adoption of solar technologies across the continent.

Agata Krawiec-Rokita, Co-founder and CEO of sun.store, shared her perspective on the year and future trends: „2024 was a year of resilience and adaptation for the European solar market. The industry continued to grow, supported by increasing demand for renewable energy and technological advancements. For 2025, we anticipate a greater focus on energy storage solutions and hybrid systems as installers and buyers seek more integrated and efficient solar setups."

SolarPower Europe: difficult prospect for 2025

SolarPower Europe's annual EU Market Outlook for Solar Power reveals that 65.5 GW of solar has been installed in 2024, just beating the 2023 record of 62.8 GW of new solar. The total EU solar fleet now stands at 338 GW, quadrupling from 82 GW a decade ago.

Walburga Hemetsberger, CEO at SolarPower Europe, said, "European policymakers and system operators can consider this year's report a yellow card. Slowing solar deployment means slowing the continent's goals on energy security, competitiveness and climate. Europe needs to be installing around 70 GW annually to hit its 2030 targets – we need to consider corrective action now, before it's too late."

The slowdown comes despite falling solar component prices and lower upfront costs for solar installations. Ground-mounted utility-scale solar projects saw an average cost decline of 28% in 2024. Despite the lower cost of capital, solar investment fell for the first time in the 2020s, from €63 billion in 2023 to €55 billion in 2024.

On rooftops, the report credits limited growth to the temporary resolution of the gas crisis. Larger solar installations are likely to grow quicker than rooftop in the EU in the second half of the decade.

PV.INDEX & PV PMI

Monthly analysis of prices in trade

PV Index traces current trading prices for solar components on a monthly basis. Data is recorded on sun.store, an online PV trading platform with 7.8 GW+ of components on offer. Trading prices are weighted by the power of components involved in the transactions to arrive at a reliable estimate for the whole market.

The PV Purchasing Managers' Index (PV PMI) is a measure indicating the overall sentiment towards the demand in the PV industry. PV PMI shows whether demand is expected to expand (above 50), remain stable, or contract (below 50), as perceived by purchasing managers.

The PV PMI was calculated as: PMI = (P1 * 1) + (P2 * 0.5) + (P3 * 0), where: P1 = percentage of answers reporting an improvement, P2 = percentage of answers reporting no change, P3 = percentage of answers reporting a deterioration. Survey is based on a sample of 800+ sun.store buyers.

▶ *https://sun.store/en*

HUNGARY

ABO Energy expands with solar parks

German-based ABO Energy has recently inaugurated and connected a 20-megawatt solar park in Hungary. The project, located near the city of Szarvas in the southeast of the country, is the largest project that ABO Energy has developed and built in Hungary to date. Sales are planned for the first half of 2025.

ABO Energy started developing the project in 2021.

By the end of 2023, the project team had secured the land and the grid connection and obtained all the permits. Construction began in 2024 and was completed in October. 'We are proud of this project success and thank all our colleagues for their great commitment. Thanks also go to the municipality and local authorities for the good and successful cooperation,' said András Kósa, General Manager of ABO Energy Hungary. The solar park will produce 38,000 megawatt hours of green electricity per year. This is enough to meet the needs of 12,600 households.

In addition to the project in Szarvas, ABO Energy is currently constructing three more projects in Hungary. Two solar parks near Szolnok with a total capacity of 14 megawatts are almost fully built. Preparations for their grid connection this winter are already underway. Furthermore, the 12-megawatt solar park in Karcag is currently under construction and is expected to be completed in December.

Grid connection is planned for February 2025. In addition to these developments, ABO Energy sold the project rights for the 250-megawatt Balotaszállás solar park in April this year. Another 9-megawatt solar project near Szakoly has been in operation since April and is to be sold next year.

photo: ABO Energy

ABO Energy's solar park in Hungary. The German-based project developer is expanding rapidly in the country.

ABO Energy's Hungarian subsidiary was founded in 2019. With the development of more than 500 megawatts and the proportional construction, 2024 is the most successful year since entering the market. A total of five Hungarian projects were connected to the grid this year. These successes are also reflected in the development of personnel: the Hungarian team has now grown to over 25 employees.

▶ ***https://www.aboenergy.com***

SPAIN

Solar power for copper production via PPA

MET Energía España, has signed two long-term PPAs. MET will buy the electricity from a solar park from Prosolia Energy to supply Atlantic Copper, the second largest copper producer in the world, with solar power via the distributor Fortia Energía.

Several companies are involved in the deal in two different phases. First, MET Energía España signed a 10-year PPA contract (Power Purchase Agreement) with Prosolia Energy to purchase the electricity generated by the Sant Jordi solar park in Castellón. The PV plant in the Valencia region has an installed capacity of 23 MW.

In a second step, MET Energía España signed an agreement with Atlantic Copper and Fortia Energía to supply the copper producer with the electricity generated by the Sant Jordi photovoltaic plant. Fortia Energía is an independent trader on the Iberian Peninsula and is one of the most important energy suppliers for large industrial customers in Spain and Portugal. The PPA signed between the parties also includes a 100% certificate of origin for all electricity.

photo: Prosolia Energy

23 MW solar park of Prosolia Energy in Castellón near Valencia.

Alberto Pérez, Power Director of MET Energía España: "One of MET's strengths in the European electricity markets is its ability to structure innovative solutions in a transparent way over the long term, creating added value for both renewable energy producers and large industrial customers. These two PPAs provide new options for the decarbonization of the Spanish industry."

Javier Martínez, CEO of Prosolia Energy: "With this strategic agreement, we consolidate our position as an independent power producer and strengthen our commitment to continue contributing to the decarbonization of the energy supply and to greater sustainability in European industry. Our collaboration with MET enables us to offer industrial customers green electricity from our plants in a baseload form adapted to their consumption needs."

Esther Alonso, General Manager of Energy Transition and Sustainability at Atlantic Copper: "This contract is the fifth in our portfolio, which we started six years ago and which now accounts for 38% of our electricity purchases. It is an important pillar of our decarbonization strategy and our commitment to the use of renewable energy to ensure a secure, competitive and clean supply."

Juan Temboury, CEO of Fortia: "Under this agreement, Fortia Energía provides Atlantic Copper with a long-term, fully renewable and reliable energy supply at a competitive price. This agreement demonstrates once again the commitment of big industry to the energy transition and its essential role in the transformation of the economy."

▶ ***https://de.met.com/en***

ALBANIA

140 MW PV project with bifacial modules

photo: Voltalia

140 MW of Trina Solar Vertex bifacial dual-glass modules are being installed at Voltalia's project site in Karavasta.

Trina Solar has delivered 140 MW of its Vertex dual-glass bifacial modules to Karavasta Solar in Albania on behalf of Voltalia. The project will be the largest of its kind in the Western Balkans.

Karavasta Solar was initiated following a call for tenders by the Albanian government for this project in 2022 and won by Voltalia, an international player in renewable energies. Trina Solar has partnered with Voltalia for this project and has been selected to provide its ultra-high performance Vertex dual-glass bifacial modules. They are mounted on single-axis trackers to suit the flat terrain of the plant, offering an installed capacity of 140 MWp.

The project is estimated to be live by end of 2023. It is set to yield 265 GWh per year, covering the annual electricity needs of 220,000 inhabitants and saving approximately 29,165 tons of CO2 per year.

Karavasta Solar is developed, built and operated by Voltalia, is financed by the European Bank for Reconstruction and Development (ERBD) and will feature a PPA revenue model. This implies that 50% of the electricity produced will be sold through a 15-year sales contract to the Albanian public operator, while the remainder will be sold through long-term contracts to private operators.

Demonstrating Voltalia's commitment to caring for the communities in which their projects are based, 1% of the company's total investment in Karavasta Solar will go towards social initiatives in the area. Additionally, 30% or more of the workforce is sourced from the local community in Albania during both construction and operation. Around 200 people are employed during construction of the project, and during operation, there will be 10-15 direct employees and 20-50 indirect employees working on site.

Constantin von Alvensleben, Country Manager of Voltalia Albania said: "Having launched Karavasta Solar in the summer of 2022, it's incredible to be working with Trina Solar to bring the project to life. We are dedicated to a cleaner, brighter future for all in a way that also directly benefits the communities where our projects are based, so we look forward to completing the project and seeing the difference it makes to the area."

Gonzalo de la Viña, President EMEA at Trina Solar, added: "Our involvement in the Karavasta Solar project is another significant milestone for Trina Solar in expanding our footprint in the fast-growing Balkan region. We are thrilled that Voltalia have chosen our modules for the Karavasta Solar site. I have no doubt that together we will make an extraordinary impact on the local community and beyond as we continue our efforts to drive the energy transition forward.

"Not only is this the largest project in the region, but it comes off the back of another major project in Albania, which was our first project to implement our Vanguard 1P single-row tracker. Our leading presence in the region highlights our commitment to delivering innovative solar solutions in Eastern Europe", de la Viña said.

▶ ***https://www.voltalia.com/***

SCANDINAVIA

Solar and wind PPAs including hybrid projects

European Energy developed the combined 180.6 MW of projects including the region's first utility-scale hybrid wind and solar project. The hybrid project allows more efficient use of existing grid connections, allowing more renewable MWh to be added to the grid without the time and expense of constructing additional infrastructure.

The agreements will deliver over 3.6 TWh over the contract period, supporting Microsoft's goal to meet all its energy demand with power from renewable sources by 2025 and be carbon negative by 2030.

"We are excited that Microsoft has committed itself to driving forward the green transition. The roll-out of renewable power is dependent on major stakeholders dedicating themselves to buying the renewable electricity that is being produced from these assets, which require substantial capital investments," said Jens-Peter Zink, Deputy CEO of

"At Microsoft, we are committed to playing our part in supporting the decarbonisation of energy grids in markets in which we operate. We're pleased the projects we contracted with European Energy have achieved commercial operation – directly contributing to our sustainability goals which includes a 100% renewable energy coverage for the company's operations by the end of 2025," said Adrian Anderson, General Manager of Renewables, Carbon Free Energy, and Carbon Dioxide Removal (CDR).

▶ ***https://europeanenergy.com/***

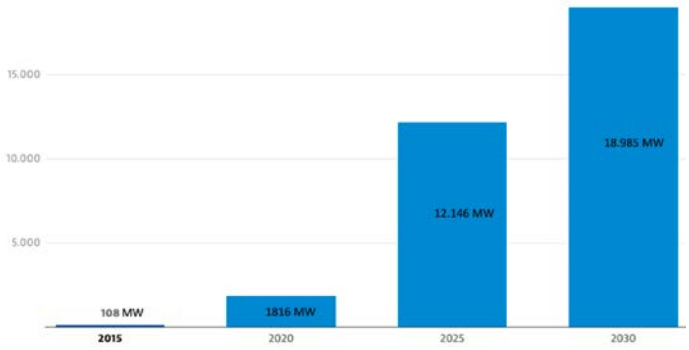
photo: European Energy

Corporate solar and wind PPA are getting more and more widespread. Now there is a new deal between Microsoft and European Energy.

POLAND

Market moves up and down, generally with good prospect

table: European Commission



Polish PV market until 2030.

The Polish pv market ranks fifth in Europe. By 2027, twenty-seven gigawatts of photovoltaic power are to be installed in the country. The drivers are many: State and European subsidies, rising electricity costs and a still large share of coal-fired electricity in the Polish electricity mix.

In 2023, a new government was elected in Warsaw, putting an end to the decade long hesitation of the conservatives. The obstacles are many, too: A power grid that cannot cope with the burdens of decentralized supply systems and bureaucracy are slowing down the pace of pv market expansion.

No energy source in Poland is growing as fast as photovoltaics. The total installed power rose to 12.1 GW in 2022. This significantly exceeded the self-imposed target of 7 GW. A further 4.6 GW were installed in 2023. By 2027, a total of 27 GW of photovoltaic power is to be connected to the grid in Poland.

The state transmission system operator PSE (Polskie Sieci Elektroenergetyczne) expects that photovoltaic systems with a total power of 20 GW will be connected to the grid between 2023 and 2032. Data from the Polish grid regulator URE (Urząd Regulacji Energetyki) confirm these prospects. The installed power of large-scale pv systems will therefore increase by more than 70 times between 2022 and 2036.

Direct supply contracts between energy producers and commercial customers have been difficult in Poland due to the lack of a legal framework. However, the government has obviously made improvements, as the topic was regularly an integral part of the pv system concept in our background discussions with companies that develop open-space and rooftop systems in Poland.

The consulting firm „Polityka Insight's" has identified the Polish power grid as a hurdle to the further expansion of solar energy installations. Polityka Insight's reports that more than three quarters of all medium and high voltage lines are older than 25 years. Distribution network operators are therefore increasingly refusing to connect new power plants or reducing the originally planned output.

The government has recognized the weak point and is working on changes to the law that will speed up the planning processes for network expansion and enable direct lines between power plants and consumers. A total of 24 billion euros are to be invested in new lines between 2020 and 2030.

The demand for micro systems cooled noticeably in 2024. After a boom in 2022, during which demand could not be met, demand cooled sharply in mid-2023. In 2024, demand continued to decline sharply. Wholesalers in particular who created new storage capacity in 2023 and filled it to the brim are now sitting on their goods, with component prices continuing to fall. But proces are expected to rise slightly in 2025.

The situation is completely different with large roof systems and solar parks. PV is by far the cheapest form of energy in Poland today, with a price difference of around five euro cents per kilowatt hour compared to grid electricity. The demand is correspondingly high and further investments are being made in installations. The expansion is currently limited primarily by limited grid connection capacities.

Representatives of the Polish Ministry of Climate and Environment pledged to do everything possible to make photovoltaics available across the country. Domestic industry is to be given greater support in the transition to solar power energy. A strong photovoltaic industry is to be created in Poland, with new jobs and interesting opportunities for investors. The expansion of grid-friendly storage capacity is to be pushed forward.

▶ ***https://en.stowarzyszeniepv.pl/***

ITALY

CCE and BWK sign PPA for a 42 MW solar plant

Swiss based energy company BKW concludes a long-term power purchase agreement (PPA) with the German-Austrian solar developer CCE Holding for a 42-Megawatt solar plant in Lazio/Italy.

This 10-year contract is he largest to date in Italy for BKW. Under PPA, BKW will purchase the electricity from the CCE Montalto di Castro solar plant. The plant produces around 65 Gigawatt hours of electricity per year. This is enough for more than 26,000 Italian 4-person households. The solar project is due to go into operation next year and is an important addition to renewable energy production in Italy.

Amanda Niklaus, Head of Department, Origination Central and Southern Europe of BWK, says: "We are delighted working with CCE on this strategically important project. This agreement is an important step in expanding our renewable energy portfolio, contributing to our decarbonisation goals and underline our strong position in the Italian clean energy market."

Cristiano Francese, Director for Energy Markets & Offtake at CCE says: „This agreement represents the first long-term PPA for CCE and it is critical to the development of the Montalto di Castro project, as well as of our pipeline in Italy. It supports CCE's goal to realise a sustainable future and the development of Italy's solar potential through partnerships like the one with BKW."

▶ ***https://www.bkw.ch/en***

▶ ***https://cee-group.de/en/***

photo: CCE

Montalto di Castro solar plant of CEE north of Rome.

FINLAND

Faerch signed PPA for solar energy

Faerch, a leading Finish supplier of circular food packaging with integrated recycling capability, has signed its second 10-year Power Purchase Agreement (PPA) with Better Energy.This contributes to realize a new solar park.

Through the PPA, Faerch will offtake enough renewable energy to cover around 70% of its annual electricity consumption in Finland. Faerch's power purchase contributes to establishing a new solar park near Hanko in southern Finland. The park will generate 38 GWh of renewable energy annually – equivalent to the energy consumption of over 2,000 Finnish households – following its expected grid connection in 2026. The solar park will turn a former parking lot into land used for renewable energy production.

photo: Better Energy

Solar park of Better Energy.

"Through this PPA with Better Energy, Faerch Group will have access to a consistent and renewable power supply, reducing our carbon footprint and contributing to the energy transition in Finland," says Tom Sand-Kristensen, Group CFO at Faerch.

"By securing renewable energy for our business, we're able to make our Finnish operations more sustainable while ensuring there is more green energy in the Finnish grid, and it's another significant milestone in our Renewable Energy Strategy that seeks to power all our sites with additional renewable energy via PPAs."

Faerch is Better Energy's first PPA partner in Finland, demonstrating its capability to deliver affordable, green energy to businesses across Northern Europe. In Finland, businesses are looking to renewable energy PPAs to reduce emissions and exposure to volatile electricity costs. The Hanko solar park, developed entirely without subsidies, reflects the growing demand for green energy driven by the market.

"Faerch's decision to expand our partnership and offtake renewable energy in Finland is another example that companies see our green energy as good for business and a way to decarbonise operations," says Mikkel Thorup, Senior Director of Power Purchase Agreements at Better Energy. "Faerch is now leading the way by using its power purchase to impact the Finnish energy transition."

The PPA in Finland builds on the existing partnership between Faerch and Better Energy. In 2023, the companies announced that Faerch will offtake renewable energy from two Better Energy solar parks in Poland.

"Better Energy's ability to provide affordable green energy in Poland made it a natural choice to extend our collaboration to Finland," Tom Sand-Kristensen concludes.

▶ ***https://www.betterenergy.com/***

SPAIN

89 MW solar PPA of ib vogt and Corning

International solar developer ib vogt has signed a virtual Power Purchase Agreement (vPPA) with Corning Incorporated for a capacity of 88.78 MW. The deal will supply electricity from the Pato solar power farm, located in the eastern region of Segovia, Spain, to the grid.

Under the agreement, power consumption by Corning's facilities will be offset with renewable electricity from the solar plant, eliminating the need for the physical delivery of energy directly from the farm to these facilities. The PV project was developed by ib vogt and will reach its commercial operation date by Q2 of 2025.

The Pato solar farm will produce about 215.6 GWh of clean solar power per year using bifacial single portrait tracker solar panels. This project will provide the equivalent of 55,000 households with green energy and prevent up to 47,000 tons of CO2 emissions every year over the project's lifespan.

In addition, ib vogt is engaging in a number of measures to mitigate risks to the environment on site. This includes the creation of two ponds to provide water for wildlife, as well as to conserve the amphibian population. ib vogt is setting up a provision of nest boxes for owls and nestboxes hidden in stone cairns for owlets, as well as erecting stands of native flora throughout the site.

ib vogt, expressed his appreciation to everyone who contributed to the successful completion of this PPA, especially Corning for their cooperation in advancing the energy transition in Europe. "We are happy to offer the necessary capacity for companies that want to achieve their environmental sustainability goals through corporate PPAs. Our pipeline of projects delivers clean and renewable energy sources for both businesses operating in throughout Europe and the people living there."

The Pato solar farm is part of the Segovia cluster that totals 513 MW with several projects in their final stages. Projects like Pato help to move Spain's 2050 goals of reaching national climate neutrality, 100% renewable energy in the electricity mix, and 97% renewable energy in the total energy mix.

This achievement was accomplished with the support from a few selected advisors for ib vogt, including Pinsent Mason as legal advisor and World Kinect as the financial advisor.

▶ ***https://www.ibvogt.com/***

photo: ib vogt

The Pato solar farm is part of the Segovia cluster in eastern Spain that totals 513 MW with several projects in their final stages.

ARRAY TECHNOLOGIES

Presenting the latest version of a dual-row solar tracker

Array Technologies has recently introduced new enhancements to the Array STI H250 solar tracker. One upgrade is the new driveline motion transmission system, providing a more precise and efficient tracking experience with enhanced flexibility.

The latest Array STI H250 presents features such as a reduced number of piles per tracker, enhanced tolerance for East-West tilt, and a wider North-South angle between rows, contributing to improved suitability for installation in challenging terrains. The slew drives restrict the movement of each row when disconnected, ensuring safe passage for tractors and streamlining maintenance tasks. This feature helps with agri-PV as it makes the tracker suitable for dual use alongside grazing animals and crops.

The tracker comes equipped not only with a new integrated control system but also with the ability to seamlessly integrate with Array's SmarTrack energy optimization software. This functionality enables the tracker to adjust its tilt based on the distinctive features of the terrain, prevailing weather conditions, and the specific geographical location of the installation. These

photo: Array Technologies

adjustments are designed to enhance the overall efficiency of the PV plant, resulting in an increase in energy capture through the effective optimization of backtracking and diffuse light strategies.

▶ *https://arraytechinc.com/*

CLENERGY

Introducing an 'ikonic' ground-based mounting system

photo: Clenergy

Clenergy, a global leader in solar mounting solutions, introduced the PVez-Rack SolarTerrace Ikon (ST Ikon), a groundbreaking ground mounting system. Designed for commercial and utility-scale projects, ST Ikon focuses on maximising installation efficiency, durability, and flexibility.

The ST Ikon system comes with a modular design that allows for adaptability to diverse site conditions, which is essential for utility-scale projects. Notably, it can be installed by a single technician in either portrait or landscape orientation, thanks to innovative positioning clamps and a self-securing design. This feature reduces manpower needs, lowers labour costs, and expedites project completion, making it ideal for high-labour-cost regions like the EU.

Clenergy's ST Ikon also prioritises safety and environmental sustainability. Its robust design ensures long-term reliability, while the use of recyclable materials and a quicker installation process significantly reduce the carbon footprint. By focusing on lowering the levelised cost of energy (LCOE), improving operational efficiency, and minimising maintenance expenses, Clenergy aims to support the transition to renewable energy effectively and responsibly.

▶ *https://www.clenergy.com/*

SCHLETTER GROUP

More efficient free-standing and tracker systems

Schletter presents a new version of the Tracker, which has been specially optimised for the use of large-format modules. The compact system requires less material per kilowatt of output.

Furthermore, the system is about 30 per cent lighter than comparable tracker models on the market. Given the high logistics and transport costs at present, this is a decisive advantage. The version called 1V has the same design advantages as the manufacturer's existing tracker: due to a mechanical self-locking mechanism, it is as stable as a fixed mounting. The tracker can withstand wind speeds of well over 200 kilometres per hour.

All systems can also be fitted with bifacial modules. In addition, they have been adapted so that the latest large-format modules can also be installed on them, both horizontally and vertically. In addition, there are new coatings that extend the service life of the mounting systems.

▶ *https://www.schletter-group.com/*

photo: Schletter Group

SMA

The Peak 3 string inverter now with new functions

photo: SMA

The Sunny Highpower Peak 3 from SMA is a compact string inverter with high power density. It offers 180 kilowatts of power while weighing only 98 kilograms. This simplifies transport and installation.

Now SMA has added new functions to the device: Sunny Highpower Storage for storage projects and Sunny Scalable Power for power-to-gas applications. The Peak 3 is the central component for a solution for large solar power plants with decentralised architecture and system voltages of 1,500 volts DC.

It enables a higher voltage and therefore more modules to be connected in series. The string inverter is equipped with the automatic SMA Service Smart Connected for service calls. This simplifies operational management and maintenance and significantly reduces service costs over the entire project term.

In combination with project-specific DC combiner boxes, the solar system can be oversized by up to 200 per cent. The Data Manager completes the system and makes it possible to fulfil all the grid operator's requirements.

▶ ***https://www.sma-uk.com/***

AIKO

The 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 All 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.

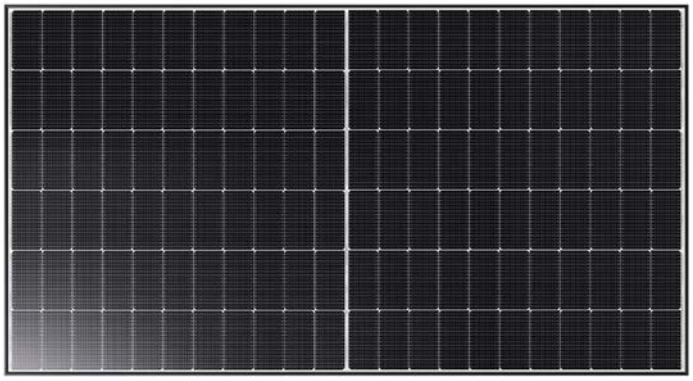
▶ ***https://aikosolar.com/en/***

photo: Aiko

WINAICO

Bifacial glass-glass modules for Europe

photo: Winaico



Winaico Germany is adding a large-format glass-glass module with an output of 525 watts to its range for the European market. The WST-525NGX-D3 solar module is designed for ground-mounted solar parks and commercial installations.

According to the manufacturer, the bifacial modules with N-type Topcon cell technology achieve a module efficiency of 22.1 per cent. The robust glass-glass construction with two times two millimetres of tempered glass, in combination with a stable 35 millimetre thick module frame, provides good resistance to weathering. The dimensions are 2,093 by 1,134 by 35 millimetres and the module itself weighs 29.7 kilograms.

Manufacturer Winaico grants a product guarantee of 25 years on the photovoltaic modules and promises a residual output of at least 87.4 per cent after 30 years.

▶ ***https://winaico.com***

SHARP

A new bifacial TOPCon glass-glass solar module

Sharp has unveiled the NBJE610 solar module, featuring a powerful 610W output and advanced bifacial technology, enabling energy generation from both sides. The module's rectangular N-TOPCon cells enhance efficiency, low-light performance, and offer a bifacial factor of up to 80%, making it suitable for various installation environments. This results in improved energy yields and an attractive cost-to-performance ratio for users.

Equipped with G12 rectangular N-type half-cells in a 132-cell configuration, the NBJE610 achieves a high efficiency of 22.58%. The module is optimised for stability across temperature fluctuations, with a temperature coefficient of -0.290%/°C, ensuring consistent performance. It is also LID-free, which minimises the risk of energy losses over its lifetime. A 30-year linear performance warranty and a product warranty ranging from 15 to 25 years, depending on the installation type, underline its durability.

The module's robust glass-glass construction ensures enhanced protection against external factors such as moisture and mechanical stress, and has received IEC 61215 and IEC 61730 certifications for safety and quality. Sharp also prioritises environmental responsibility, ensuring the module's materials, including the glass, can be fully recycled.

photo: Sharp

▶ *https://www.sharp.eu/solar-energy/explore-sharp-solar-panels*

KACO NEW ENERGY

New inverter for commercial use

Manufacturer Kaco New Energy has equipped the new Blueplanet 100 NX3 M8 and 125 NX3 M10 string inverters with multi-MPPT technology. This makes them ideal for complex and larger roof systems in trade and industry.

The two inverters also have many expansion options. The devices work particularly efficiently thanks to the silicon carbide semiconductor technology used. They therefore ensure a higher system yield and are particularly robust thanks to their component design, the manufacturer announces.

Kaco also develops and manufactures the Blueplanet 100 NX3 and 125 NX3 units at its headquarters in Germany. As most of the suppliers also come from Europe, the inverters have a relatively small carbon footprint. Customer service and a wide range of other services round off the overall package.

▶ *https://kaco-newenergy.com*

photo: Kaco New Energy

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