Making sense of new energy opportunities

An EKO engineer at the Ami Solar Park inspects an MS-80SH test unit

With the economics of solar power looking increasingly favourable, there is a rush to invest and expand. PES was delighted to have a conversation with Kees Hoogendijk, Managing Director, EKO Instruments Europe. We discussed how sensor technology could help improve ROI and mitigate any potential imbalance in the supply and demand of experienced or qualified experts at a time of such rapid growth.

PES: Thank you for taking the time to speak with me, Kees. You are a familiar name to PES of course, but for the benefit of new readers could you start with a brief introduction to EKO and what you do?

Kees Hoogendijk: EKO Instruments was founded in Japan 95 years ago and develops industry-leading solar energy sensors and scientific instruments for environmental research.

One of our most famous products is the MS-80 pyranometer. We launched it in 2016 and at the time it was the only ISO 9060:2018 Class A solar sensor on the market, in the top tier fast-response and spectrally flat sub-categories. We've since launched the MS-80S, part of our S-Series range of elite sensors with internal diagnostics and, coming soon, the MS-80SH.

The MS-80SH has all of the same S-Series features as the MS-80S, plus an integrated high-efficiency solid-state dome heater, continuing to build on our legacy of class and industry-leading solar sensors.

PES: We're a few months into 2022 now, how have you been finding things recently? The solar industry is evolving fast isn't it?

KH: The climate crisis, the pandemic, Ukraine, the world is changing. Now is a time of significant risk and opportunity, with unclear outcomes.

One thing, however, is clear; there is no going back. The solar industry is a fundamental part of the new energy balance that must be achieved globally and, despite the challenges, there is a lot to be optimistic about.

Now more than ever, maximising yield, boosting or speeding up ROI on new and existing solar plants is crucial, and EKO has the solutions to help our customers achieve those goals.

PES: Are there any particular changes and developments you are seeing?

KH: We've used the last two years to study the needs and requirements of our customers, to analyse the market and available solutions.

Pre-pandemic, and since, the single most industry-defining development is almost certainly the rapid proliferation of new solar applications, driven by, amongst other things, increased government support, falling costs, and improved efficiencies.

Solar power has essentially proven itself. The economics of it are increasingly favourable, and this, in turn, has fuelled a new gold rush. While complicating global logistics, more recent events further strengthen the case for solar as a secure and independent energy source.

PES: What does this mean for you as a manufacturer of solar energy sensors?

KH: Rapid growth in any industry can lead to an imbalance in the supply and demand of experienced or even qualified experts. Our response to this challenge has been to make our products more accessible, more user-friendly, and easier to set up.

Our STR sun trackers align themselves. Many of our S-Series sensors, including the MS-80S, feature a 4-channel digital and analog interface. The MS-90 Plus+, meanwhile, a top-rated product over the last year, is a compact, robust, total solar irradiance measurement solution and a cost-effective alternative to larger sun tracker-based options.

PES: How has EKO been responding to these changes and new demands in terms of product development?

KH: We looked again at what our customers need or may need in the near future. We looked at the available solutions and asked

ourselves, how can we improve on them and make this easier to use or more efficient?

Quality has always been a critical ingredient for EKO. Our designers and engineers take the idea of 'Made in Japan' and everything that it means very seriously.

The result is a new product like the MS-21 Pyrgeometer, designed for climate research applications, meteorology and scientific studies, it employs a new thermal coupling construction and has outstanding low thermal resistance. It measures in the IR range, beyond the Solar spectrum, and can be exposed to direct sunlight without any problems.

Or the MS-10S and MS-11S, our next-generation UVA and UVB radiometers with long-term UV stability that's far superior to past technologies. Part of our S-Series range of solar monitoring solutions the MS-10S and MS-11S also come with internal diagnostics for remote visibility over internal temperature, humidity, tilt and roll angle, plus the same 4-channel smart interface as the Class A MS-80S pyranometer, making them compatible with 99% of data loggers, DAQ and SCADA systems.

We've also re-invented the EKO sunshine duration sensor, with the MS-09S now based on EKO's universal sensor design; it doesn't need to be calibrated and has no orientation, angular or detector temperature dependency. It is, however, compact, light, easy to manage, install and part of the S-Series family of products with the same benefits and features.

The MS-80SH is another example, adding an integrated, high-efficiency, solid-state dome heater to the already industry-leading features and characteristics of the fast-response and spectrally flat Class A MS-80S. The improved dew and frost resistance of the MS-80SH make it the standout choice for IEC 61724-1:2021 Class A monitoring and any application relying on value, accuracy, speed and reliability.

PES: Cost is always an important factor of course, so is there a particular demand for accurate, cost-saving alternatives to larger solar monitoring stations?

KH: Of course. Higher costs increase the amount of time needed to achieve positive ROI. Every project or application, whether commercial or academic, public or private, must be conscious of cost. That's why we have developed solutions like the MS-90 Plus+, for example, ideal for solar resource assessment or PV monitoring applications where a larger solar sensor monitoring station may not be possible.

But it's not just about alternatives. We've prioritised build quality and accuracy to offer our customers the best solution for their needs. Sensors that are built to last.

STR-22G Sun Tracker & MS-57 Pyrheliometers at IPC 2021 in Davos, Switzerland

Kees Hoogendijk

Our S-Series sensors, for example, all come with Level A EMI/EMC electronic surge filters and protection and internal sensors, helping to reduce the need for physical checks and maintenance. While the MS-80, MS-80S and MS-80SH pyranometers all come with an industry-leading 5-year warranty and re-calibration period.

Our products save our customers time and money, speeding up ROI with unbeatable accuracy and reliability.

PES: How do you ensure that the diagnostics and overall performance are not compromised though?

KH: The simple answer is hard work. Our engineers are constantly refining the designs of our products throughout development. We spend time with our partners and suppliers to ensure that the parts we use are the best they can be, that our construction methods are the best they can be; nothing is left to chance.

In 2013, EKO became the first ISO/IEC 17025 certified solar sensor manufacturer in the world, helping to validate and maintain the highest standards in calibration and testing. Today, we are still the only solar sensor manufacturer to own and operate our own solar parks, an invaluable test-bed for research and product development.

PES: Is sensor technology evolving at a similar pace to the solar industry, or perhaps it's even faster?

KH: I think we are in a period of refinement now. When we launched the MS-80 in 2016, that really was a revolution in pyranometer design and construction. Six years later, and we are only now starting to see the lessons of that leap forward across the industry in the use of single domes and quartz diffusers on Class A sensors, for example.

EKO, however, won't rest on its laurels. The solar industry's rapid growth is throwing up new challenges and requirements and our

goal, as always, is to continue producing industry-leading solutions to meet them.

PES: What are some of the main developments you have been involved with and have seen since the last time we spoke in 2021?

KH: Besides the products I've already mentioned, we've also developed a range of IV measurement instruments and recently introduced the PV-Blocks PV Evaluation System.

PV-Blocks is a unique, customisable solution for testing experimental PV technologies like Perovskite, Hybrid, Organic, and high-capacity Bi-Facial modules out in the field. It connects pyranometers, sun trackers, pyrheliometers, spectroradiometers and other meteorological products to maximise PV research applications and can scale to test multiple modules in parallel.

I'm always excited to offer or bring a solution to the market that takes advantage of the synergy between our different products to solve a clear challenge for our customers or do something new for them.

PES: Looking to the future then, what do you think that looks like for sensor design, is something even more sleek, intelligent and cost-effective likely?

KH: I mentioned the MS-09S earlier and our new universal sensor design. Besides clever optical solutions, and smarter features, this really is the best answer or example that I can offer, because we are doing it already.

In 2019 we pledged to reduce our plastic use. The pledge was mainly targeted at packaging, and we have made big changes, introducing a completely plastic-free design for our pyranometer boxes.

However, we also asked ourselves how we could be more efficient and if we could make cost savings that we could, in turn, pass on to customers. This is where the universal sensor design idea came from.

The MS-09S Sunshine Duration Sensor, the MS-10S and MS-11S UVA and UVB radiometers, the MS-40S Class C Pyranometer, the Class B MS-60S, and Class A MS-80S all employ the same universal design. They all use the same sunshield design and fit in the same plastic-free packaging.

EKO's universal sensor design is modelled on our flagship, elite, Class A MS-80 pyranometer, and we have made and will continue to make more of our products based on this design.

PES: What do you anticipate the main requests from your customers will be as the demand for solar grows?

KH: Accessibility, connectivity, and improved data visualisation. That is to say, apps, software, and even greater ease of use; helping our customers to access, see and make use of the data from their sensors.

I also expect increasing demand for data as a service, automation and AI-based features in the next 5 to 10 years, particularly for site management and maintenance.

PES: Are you optimistic that you will be able to match these needs?

KH: That's the mission.

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* The MS-80SH Class A Pyranometer with integrated dome heater, the MS-09S Sunshine Duration Sensor, and the MS-10S UVA and MS-11S UVB Radiometers are currently in development, due to release in 2022.