



# Making solar power plants safer

Investing in continuous education from the start contributes to safety, leading to long-term cost savings and improved financial returns at HelleniQ's 204 MW PV plant in Kozani, Greece

Why is safety a priority for the solar industry? Why are meticulous handling methods and installation procedures of the smallest components in photovoltaic systems so important? PES wanted to find out more about this topic by talking to Dominic Buergi, Global Head of Services Renewable Energy at PV connector market leader Stäubli.

**PES:** Thanks for taking time to speak to us today, Dominic. A few years ago, Stäubli launched an awareness campaign entitled 'Small components. Big impact' taking a closer look at the role of photovoltaic connectors. What's the reason for that?

**Dominic Buergi:** Thank you for this question. First, I would like to look at a few facts and figures. With a 37% share, solar power represents the largest part in renewable energy worldwide and also leads capacity growth with an increase of

32%. So, photovoltaics plays an important role in generating reliable, affordable and clean energy. But photovoltaic plants are nowadays also long-term investments that require close management and monitoring. We must consider the fact that these solar



systems are power generating plants just as any other hydropower plant or even nuclear power stations. Therefore safety and reliability must take priority.

The 'Small components. Big impact.' campaign revealed interesting facts about the role of small photovoltaic connectors and their effect on the reliable and safe performance of the solar power plants.

**PES: Can you tell us more about these facts? Are they just about technical aspects?**

**DB:** Safety and reliability are not only based on technical aspects. They also influence commercial facts. For example, if we compare the total investment cost of a PV system, the costs for cabling make up less

than 1% and the connectors just 0.03% of the overall costs. So why choose low-quality connectors that will not provide long-term contact reliability? The PV DC connectors of Stäubli's Original MC4 product portfolio provide the highest contact quality and are designed for reliable operation lasting more than 25 years. It is not without reason that more than 50% of the world's PV capacity is connected with our PV DC connectors.

However, there is even more to it than selecting the right products. We must consider two additional fields of activity: connector assembly and connector installation. It is paramount that the PV connectors are first assembled using appropriate techniques and tools and,

second, installed properly and correctly within the PV system once assembled. The connectors must be embedded in a sound DC wiring strategy.

Latest research and publications clearly show that these are areas of significant cost contribution if executed incorrectly. All these reports share a concern about the growing underperformance of PV assets. Heliovolta's PV health report indicates that almost 74% of the detected issues in a PV system are related to the direct DC distribution. This category encompasses a significant portion of problems, primarily involving PV wiring and connectors.



In a 200 MW large-scale PV plant there are more than 1 million connectors that could potentially fail if not assembled and installed correctly

**PES: Astonishing. That sounds rather serious. What can be done to improve this situation?**

**DB:** Stäubli is working on various solutions. On one side, there is product improvement, research and development. On the other side, we are expanding our service offerings with training and education through different channels to create safety awareness and transfer knowledge. We can consider the DC wiring system and the connectors, also known as the eBOS system, as the lifelines of a PV system responsible for transmitting the electric power.

By avoiding downtime and assuring as much uptime to these 'lifelines' as possible, our products are critical to the performance of the PV system. Just imagine, that a 200 MW large-scale PV plant can have up to half a million solar modules. This equates to more than one million connectors, any of which

could potentially fail and significantly impact the asset's profitability.

As Stäubli is committed to improving safety in the PV industry, we are sharing our knowledge and the gained expertise from being active in this industry for more than two decades. Our Training Academy provides specialised courses to improve the knowledge base of the various stakeholders within the PV industry. Topics such as the PV connector configuration and assembly techniques are a focus, as well as a wide range of installation guidance, especially regarding connector and wiring strategies.

**PES: So Stäubli does not only provide products for the DC wiring system in a PV plant but also training. How can you make sure that there will be learning outcomes?**

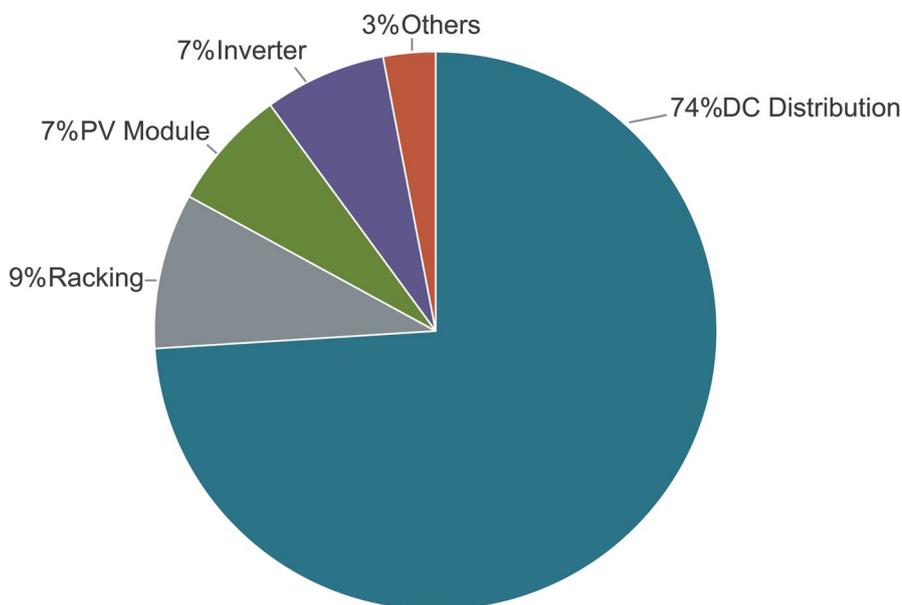
**DB:** Knowledge is shared in different settings and formats, including virtual

self-learning sessions and in-person classroom seminars. We use various means to verify participants have engaged and internalised the content and offer different levels of training acknowledgement. For example, when enrolling for online training candidates receive a Recognition of Attendance document.

Certain courses include a Certificate of Qualification confirming that the trainee has successfully completed a practical test. This proves that the participant has gained the necessary skills and proficiency in the respective topic.

Our advanced training courses are accredited by North American Board of Certified Energy Practitioners (NABCEP), which is specific to the US market and enables candidates to collect credit points towards an overall industry-wide certification.

Our training services aim to enhance system safety, reduce downtime and focus on the potential to improve productivity of the PV assets.



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74% of all issues were located in the DC Distribution section of PV systems.  
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**PES: What's your experience of increasing the awareness of these aspects in the industry?**

**DB:** Generally speaking, it depends on the role of the stakeholders in the PV project and also the stage of the project. Quality-driven organisations are strong supporters of continuous education within their teams and personnel. We are in close contact with various asset owners, EPCs and O&M teams to define and develop a training itinerary tailored to their needs. The safe operation of a PV asset is a priority for us. Our training services aim to enhance system safety, reduce downtime and focus on the potential to improve productivity of the PV assets.

**PES: You mention an interesting aspect; the exchange between the owners and**

**O&M managers. Can we look at this more in depth?**

**DB:** Stäubli provides more than just PV connectors and eBOS components for DC wiring. In addition to the training services offered through our Training Academy, we provide a variety of supplementary technical services. These services can be utilised during the design and planning stages of a project or later on-site during construction, offering detailed quality assurance focus on wiring strategies and PV connectors. Our commitment to close collaboration with customers is matched by their appreciation for the comprehensive support and guidance embedded in our services.

[staubli-renewable-energy.com](https://www.staubli-renewable-energy.com)



**Dominic Buergi**

**Global Head of Renewable Energy Services Business at Stäubli**

Dominic has substantial professional experience in the industrial sector, focusing on advanced technical solutions. He has delivered strategic consultation and operational support to clients worldwide, demonstrating a proven ability to develop markets and establish solid, strategic customer relationships. He holds a Bachelor of Science in Business Engineering from the University of Applied Sciences Northwestern Switzerland.

As a subject matter expert at Stäubli Renewable Energy, Dominic has been instrumental in managing and planning the development of the photovoltaic product portfolio, taking into account market trends and customer requirements. He frequently shares his expertise with customers through training sessions.

Dominic is active participant in several international and national technical committees dedicated to promoting the safe and reliable use of photovoltaic connectors in a variety of contexts.