Towards a connected future

With its proven expertise, cross-industry innovation and a broad range of connectivity solutions, TE Connectivity is establishing an intelligent link between the panel and the grid. Daniel Ribeiro, Global Product Manager, Solar Energy Division and Michael Kazimierczuk, Director Sales AMS, Renewables and Industrial, of the Energy Business Unit explain how the business is helping to drive the future of solar power.

PES: I'm looking forward to learning more about TE Connectivity today and where you sit in the solar landscape. Could you explain the background of the company briefly to begin with?

Daniel Ribeiro: Absolutely. TE Connectivity is a global industrial technology leader. Our mission is to create a safer, sustainable, productive and connected future. We have a broad range of connectivity and sensor solutions, proven in the harshest environments, that enable advancements in transportation, industrial applications, medical technology, energy, data communications and the home.

We are a global company with more than 85,000 employees, including over 8,000 engineers, working alongside customers in approximately 140 countries. TE ensures that every connection counts.

Energy is an important part of TE. Our products and solutions protect wildlife and energy sector assets, advance renewable energy, build reliable power grids and enable the smart grid of the future. Customers rely on us to innovate and keep the power on.

PES: So whereabouts does the business fit within the solar industry in particular?

DR: Renewable energies are a key priority for us. Our advanced solar solutions are developed in step with customer needs. We design them to support the accelerated implementation of solar farms. For example, our Customisable Trunk Solution for DC collection applications helps reduce installation time up to 50% and can achieve up to 40% savings in material costs. That is a lot of time and money when you think about it.

For us, solar is a business that has grown at a breathtaking rate since 2020 across the world: the Americas, Europe, China, and Australia. We have a diverse offering of products and services spanning DC EBOS, MV Collection, Substation and Transmission applications, as well as wildlife and asset protection solutions, and offerings in the grid reliability and grid monitoring areas.

PES: How big a market has this become for you and how quickly?

Michael Kazimierczuk: Solar installation accounted for 20 GW or 50% of all new electricity-generating assets added in the U.S. in 2022: enough to power 25 million homes, according to the Solar Energy Industries Association.

Daniel Ribeiro

Michael Kazimierczuk

In the past four years we have grown at record pace in this area: in terms of our business and in terms of the products and solutions we offer. We expect this will continue at a similar trajectory over the next 10 years as the industry stabilises and brings consistency with the various positive tailwinds like government incentives and the continued decline in Solar's levelised cost of energy.

In the Americas we are the preferred supplier for many of the top EPCs and Developers, as they value the flexibility of the solutions we offer and see the direct impact as they increase their pace to meet aggressive growth targets.

PES: Is there potential for further expansion in this market for you, do you think?

MK: In solar, the potential is endless. This is a sector that will both expand and mature in the coming years. New technologies open new avenues of possibility in our area, the connectors, and in the other parts of solar farms. Everything from the robotics of cleaning to the materials the solar panels are made of and how they are held in place. I am confident we will see radical change in all these areas. The solar farms of 2050 will look very different from those we have today.

In terms of our business, we are always looking for opportunities to make our offering appealing to customers. We do this by investing in innovation and by expanding the range of services we offer.

PES: How has the customer profile changed over the past year or two?

MK: At the start we partnered with a handful of key players and the market was much more consolidated. As the industry has grown the customer base has become much more fragmented.

Decisions on electrical balance of system solutions now can come from either EPCs, developers, utilities, or even subcontractors, so it is even more critical that our go-to-market infrastructure matches that of this ever-changing landscape.

PES: What products and solutions are customers looking for and how has this changed recently?

MK: Every customer is different; they each have their own specific needs and priorities. The flexibility of our solutions allows us to optimise our offering for each of our customers.

The main shift has been the velocity of construction and the increased size of the projects that bring efficiencies of scale for the EPCs. Our Customisable Trunk Solution (CTS) is ideal as it can help reduce the installation time by up to 50%. And our Solarlok 2.0 connector can be implemented

in as little as 15 seconds! Both solutions provide much-needed time savings.

The other trend we see is towards lighter, neater solutions that optimise design and space. As the sector expands at pace, the main players look for solutions that make the best use of each foot of land, each centimeter of cable. TE's CTS supports them in this as sustainability and mindful resource use are key values we also share.

Finally, customers are looking for new solutions in monitoring. Earlier this year, TE acquired Kries, a leading smart grid company. With this, customers can benefit from a total solution, including more intelligence on their solar farm.

PES: What services does TE Connectivity bring to the table?

MK: We offer our solutions with a developed suite of engineering services tailor made to suit each customer's needs. As an innovative leader in the renewable energy sector, we offer solutions from panel to inverter, substation, and energy storage.

Our mission is to help customers boost efficiency while achieving safe, stable, and reliable operation of PV and wind power plants, which is also our advantage. Ultimately, our work furthers the sustainable development of the industry.

The services we provide include engineering optimal project designs, commissioning testing, supervision, in-field troubleshooting, as well as grid monitoring and smart grid technologies, which form a key part of our offering.

Our team of in-house design engineers, project management teams, testing experts and field service technicians are vital in ensuring projects run smoothly from initial concept to energisation.

PES: One area that you are particularly focusing on now is your Customisable Trunk Solution, or CTS, tell us more about these.

DR: Solar farms benefit improved efficiency in power generation and the process of cabling and installation is significantly easier than with other conventional solutions that lay the cable underground: our CTS can save customers up to 40% on material and labor.

In addition, our dedicated solar design and engineering teams worldwide help customers optimise their DC collection system, do cost analysis and train the teams in the field. Customers can trust that we will be by their side from the beginning of the project to the delivery and beyond.

PES: What are the technical advantages of CTS?

DR: With CTS customers really own their solar farm layout and can respond to the specific nuances of their location or any unexpected circumstances that may come up during the installation.

Our patented Solar Insulation Piercing Connector (IPC) has been specifically designed for solar farms and can be installed where it is needed in the field. And if during the implementation phase customers experience any unexpected issues our system has the built in flexibility to adapt fast.

CTS dramatically reduces the amount of trunk bus wire needed with a traditional system. This reduces the customer's efforts on materials and labor. The resulting solution is neater and cleaner in design.

PES: Do you have any real-life examples of your systems in use in the solar industry?

MK: Absolutely, as TE's CTS is already enabling over 12 GW of total net new generation - and this is just the start. We are seeing mass adoption of our systems in multiple geographies as we work with our customers to continually optimise this solution to lower the cost of solar energy.

In the United States we saw one instance where a customer identified an issue relating to a portion of the territory being classified as protected land. Thanks to our design flexibility and our teams' agility and responsiveness, we were able to support them in finding an elegant and productive solution to this issue while avoiding any delay in implementation.

Another unique advantage of CTS is the ability to design load break disconnect switches anywhere in the array, leveraging the ability to do partial or full clusters close to the customers central inverter location for optimised efficiency in cost, maintenance, and, most importantly, safety.

PES: Customer service is extremely important to TE Connectivity. Can you explain how you work with your customers?

DR: TE does everything possible to ensure we take the customer's perspective throughout the process, especially when prioritising the most critical areas that define the project's success. Our design engineers work hand-in-hand with the customer to maximise space utilisation, minimise cabling lengths, and optimise energy yield by lowering voltage drop across the site, while also ensuring the most efficient constructability practices are met.

Secondly, our project management team takes over from the moment the agreement is final to the successful delivery of the products. We offer seamless communication every step of the way: providing real-time product delivery updates, training and ensuring the on-site team has a choice of sustainable logistics and packaging options.

As a full-service solutions partner, working with TE Connectivity provides ease of mind thanks to a deep understanding of customer challenges and our experience and resources to drive project success.

PES: How do you see this relationship with solar customers evolving over the next few years or so, as the market develops?

MK: As the market continues to experience explosive growth with political and now social acceptance and support, the technology and market dynamics will also experience drastic change.

Solar installation costs have dropped more than 50% over the last decade. Combined with multiple technological breakthroughs, this means that companies must be agile and think long term about strategising their resources to match the speed of this change. We only see this trend accelerating over the next 10 years.

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