

25.4% efficiency milestone for solar cell manufacturer EMMVEE

German technology partnership drives TOPCon success in India. Successful ramp-up at EMMVEE leads to follow-up orders for German technology providers

Bengaluru/Konstanz/Blaubeuren/Gütenbach, June 23rd 2026. EMMVEE, one of India's leading photovoltaic manufacturers, has successfully ramped up its new 2.9 GW TOPCon solar cell production line, achieving solar cell efficiencies of up to 25.4% on M10 wafers. Building on this success, German technology providers involved in the project have now received follow-up orders, underlining EMMVEE's confidence in their equipment and expertise.

The production line integrates German high-end equipment from centrotherm, RENA, and halm. The successful ramp-up was supported by the International Solar Energy Research Center Konstanz e.V. (ISC Konstanz) which provided process integration and technology transfer services to the German project partners in close cooperation with EMMVEE.

Having been active in solar module manufacturing for decades, EMMVEE is currently expanding upstream into solar cell production with a 2.9 GW TOPCon facility in Bengaluru. centrotherm coordinated the setup of the production line and engaged ISC Konstanz to support process integration and the technology ramp-up in early 2025.

"The successful ramp-up and the subsequent follow-up business demonstrate the value of close cooperation between equipment suppliers and technology experts," says Dr. Helge Haverkamp, CTO of centrotherm. "Together, we have shown that German engineering can deliver outstanding results in highly competitive photovoltaic markets."

RENA Technologies supplied the wet-chemical processing equipment for the production line, providing high-throughput solutions for surface texturing and cleaning – essential process steps for achieving high-efficiency TOPCon solar cells.

"Achieving peak efficiencies of 25.4% in a newly established production environment is an outstanding result," says Dr. Damian Brunner, R&D Director Solar at RENA Technologies. "It demonstrates how advanced wet-processing technology, combined with strong partners and a highly committed customer, can accelerate the industrial deployment of next-generation solar cell technologies."

For the multi-GW follow-up order RENA will supply several units each of BatchTex 3 N600, InEtchSide 4+ BSG (Borosilicate Glass removal), InEtchSide 4+ PSG (Phosphosilicate glass removal), BatchEtch 3 N600, and BatchPolyClean 3 N600. To ensure highest competitiveness, the tools are

equipped with the latest and most efficient water-, chemistry- and power-saving solutions on a very low footprint which results in significant OPEX savings for the customer. “With delivering our latest wet processing technology, we are making sure our customer benefits from the best-in-class CoO securing a long-term success for their fab.” states Michael Vees, Sales Director Solar.

The ramp-up has now been successfully completed, with solar cells reaching efficiencies of up to 25.4%. The achievements of the project, combined with the newly awarded follow-up business, highlight the competitiveness of German photovoltaic equipment manufacturers and technology providers in the rapidly growing global solar market.

ISC Konstanz supported the German equipment suppliers with onsite process integration and technology transfer activities, working closely with EMMVEE and the project partners to establish stable, high-performance production processes.

The collaboration between EMMVEE, centrotherm, RENA, and ISC Konstanz demonstrates how partnerships between manufacturers, specialized equipment suppliers and independent technology institutes can accelerate the industrial deployment of advanced photovoltaic technologies worldwide.

About ISC Konstanz e.V. – Partner for high-efficiency solar manufacturing worldwide

The International Solar Energy Research Center Konstanz e.V. (ISC Konstanz) is a research institute for the development of solar cells, solar modules and renewable energy systems. It was founded in 2005 as a non-profit association. The team of more than 70 scientists, engineers and students works together with leading international institutes and companies in the photovoltaic industry on national and international research projects.

About centrotherm AG

Thermal production solutions and coating technologies are among centrotherm's core competencies. For over 70 years, the company has been developing and implementing production concepts for a steadily growing international customer base. In addition to growth industries such as the semiconductor and microelectronics industries and photovoltaics, the innovative solutions are also used in new future fields such as fibre and battery manufacturing. As a leading, globally active technology group, centrotherm works closely with partners from industry and research to generate valuable competitive advantages for its customers.

About RENA

RENA Technologies is the global technological leader for wet processing equipment.

We provide the most valuable, innovative wet-chemical solutions for our clients to reach the next level of state-of-the-art. We manufacture highest quality flexible and high-throughput equipment in the Semiconductor, MedTech, Glass and Renewable Energy sectors.

Press contact

For more information, please contact us or visit our website:

Your contact person: Rudolf Harney

Phone: +49 7531-36183-25

E-mail: rudolf.harney@isc-konstanz.de

www.isc-konstanz.de

Appendix: Images



ISC Ramp-up Team at EMMVEE, Bengaluru. From left to right: Yashpal, Mertcan Comak, Sebastian Veerman, Jan Hoß, Vaibhav Kuruganti and Saman Sharbaf.