



H-TEC SYSTEMS: delivering on what matters – efficiency and availability

With more than 25 years of experience in PEM electrolysis and – as a daughter company of MAN Energy Solutions – operating under the umbrella of the German giant Volkswagen, H-TEC SYSTEMS has all it takes to realise its strategic objective to become one of the top three players in the global PEM electrolyser market. As the company prepares to go large scale, we talked to Jonas Wahl, Director of Product Management, to learn more about the company’s current projects and vision for the future.

By Matjaž Matošec

Since its establishment in 1997, H-TEC SYSTEMS has been among the pioneers in PEM electrolysis. In 2017 the company launched its first 225 kW electrolyser and is now on the verge of bringing to the market a 10 MW modular electrolyser scalable to upwards of 100 MW. Such a rapid development of industrial-scale solutions would not have been possible without the backing of MAN Energy Solutions, which had obtained a minority stake in the company in 2019 and then fully acquired it in June 2021. This new ownership has provided H-TEC SYSTEMS with access to a wealth of world-class expertise in many

key areas, including competence in plant EPC, long track record in large-project execution, as well as Volkswagen’s vast experience in serial production and know-how in building up supplier networks.

Driving energy transition

One indicator of the company’s ambition is the growth of its workforce. In February 2022, when Jonas joined H-TEC SYSTEMS, following 10 years at MAN Energy Solutions, around 100 employees worked for the Augsburg-headquartered tech business. In just 12 months, this number has tripled



Jonas Wahl, Director of Product Management at H-TEC SYSTEMS

and is expected to reach nearly 600 by the end of 2023. Thus, a six-fold increase in less than two years.

The growing H-TEC SYSTEMS team will be instrumental in materialising the company's plan to play a major role in the energy transition. "Our vision is to eliminate 1% of man-made global CO₂ emissions, which we intend to achieve by being among the top three PEM players enabling net-zero goals to be achieved," says Jonas.

These bold aspirations are based not only on a strong technological core developed over a quarter of a century, but also on the financial security provided by MAN Energy Solutions. "Our parent company has committed to invest EUR 500 million in H-TEC SYSTEMS in the coming few years," explains Jonas. "This means that our growth plans are fully funded, making us perfectly positioned to quickly ramp up all aspects of our operations and remain laser focused on delivering on what matters most – efficiency and availability."

Comprehensive product portfolio

The principal building block of all H-TEC SYSTEMS electrolyzers is the PEM stack technology developed and manufactured at the company's stack production site in Hamburg, Germany. This is a tried-and-tested design that has been continuously enhanced over the last

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25 years. It forms the heart of three product lines, all characterised by exceptionally high efficiency.

"The first product line is the ME450 containerised electrolyser – a turnkey solution optimised for 1–2 MW projects," explains Jonas. "With a system efficiency of 75% at 30 bar pressure, this is the most efficient PEM electrolyser currently available in the market, and the efficiency level is even higher with heat utilisation. Our philosophy is to focus on the efficiency of the entire plant, which is what truly matters to our customers. This is what distinguishes us as the market often only communicates the efficiency of the stack, but not the overall system efficiency."

Using 1 MW of renewable electricity, this electrolyser can produce 450 kg/day of 5.0 quality hydrogen. The system is also very fast as it can be ramped up from stand-by to full load in just 30 seconds, which means no waste of valuable electricity.

"For projects in the 4–10 MW range, we offer the Hydrogen Cube System (HCS) – a modular system, which is also containerised and equally efficient as the ME450," continues Jonas. "And for even larger projects, we have developed a 10 MW electrolyser for indoor installation, scalable to 100 MW. This industrial-scale solution is to be launched this spring and boasts an even higher efficiency of 78%."

It is worth noting that the company has a proven track record of significant product scale-up every two years, having increased the power of its electrolyser solutions by a factor of 5 multiple times since the market launch of the first electrolyser in 2017, which is no mean feat.



Thanks to the global service network of MAN Energy Solutions, H-TEC SYSTEMS has a worldwide network, with more than 100 service centres across five continents.

Smart design – high efficiency

The design of H-TEC SYSTEMS electrolyzers is based on a smart modular concept, which groups multiple stacks into independently controllable cascades that can be combined to form systems of various capacities. While already busy developing a larger stack, which may be more practical for green hydrogen production plants exceeding 100 MW in capacity, the use of a small stack in systems with capacities below this three-digit threshold comes with significant advantages.

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“Our design solution on the stack level is highly beneficial, especially because of its inherent redundancy, which is of great value to customers in such a young market,” explains Jonas. “In case of a stack failure, only one stack cascade can be switched off, while all other cascades continue operating at full capacity, meaning no system downtime and higher overall efficiency. And once the replacement stack is delivered to the site, it takes just 2–3 hours to replace the stack and

have the system up and running at full capacity again. So, this inherent redundancy is one of many unique aspects that set us apart from other players in the market. And, more generally, we always keep in stock spare parts for off-the-shelf peripheral components.”

Extensive service offerings

Seeing system efficiency and availability as key downward drivers of the levelized cost of hydrogen (LCOH), H-TEC SYSTEMS provides an extensive portfolio of service offerings that cover the entire lifecycle of their products.

Stack Gigafactory in Hamburg

At its production site in Hamburg, H-TEC SYSTEMS is building a new electrolyser stack Gigafactory, scheduled to become operational by the beginning of 2024. This new facility will allow the company to significantly increase its stack production capacity. Drawing on Volkswagen’s competence in building large-scale plants for serial production, the facility will feature a fully automated, state-of-the-art production line capable of fulfilling a significant share of future global demand. This plant is part of H2Giga, a flagship zero-emission technology project launched and funded by the German government to accelerate mass production of PEM electrolyzers.



“We see the purchase of our product only as the beginning of our relationship with the client,” says Jonas. “Within our service portfolio, we offer three different levels of support that customers can choose from, based on their requirements. The first one involves constant remote monitoring from our control centre in Augsburg, which includes predictive analysis and recommendation for action when needed. The second level, called *Revision & Inspection*, encompasses regular on-site health checks and component repairs, so preventative maintenance carried out periodically to ensure uninterrupted plant operation. And the third, all-inclusive level, called *Operation & Maintenance*, provides a 360° service package for the lowest possible LCOH.”

Global presence

With two production sites in Southern and Northern Germany, H-TEC SYSTEMS is strategically located to directly supply and support many hydrogen projects currently being developed and planned in Germany and further afield. While the Hamburg site focuses on PEM stack development and production, in Augsburg, the company develops, manufactures and assembles the complete electrolysers.

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“Being near to all existing and upcoming hydrogen projects is of great importance to us and of immense value to our customers,” says Jonas. “If you need support, we can be there within 48 hours, no matter where you are.”

A number of H-TEC SYSTEMS electrolysers are already producing green hydrogen in Germany, Austria and Sweden, with ongoing projects in other countries. With the imminent launch of an indoor 10 MW electrolyser system and the stack Gigafactory developments well underway, the company is poised to rapidly expand its fleet of operating electrolysers and live up to its slogan: *Hydrogen is now.*

Meet H-TEC SYSTEMS at HTW2023

Did you know that H-TEC SYSTEMS will be exhibiting and presenting at the upcoming Hydrogen Tech World event in Essen, Germany? Visit their stand F07 to learn more about the company’s product and service offerings, and make sure not to miss their conference presentation on Wednesday, 5 April, at 11:15, when Product Manager Gregor Ziemann will talk about how to reduce the LCOH.