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TMEIC Strengthens Its Contribution to the Hydrogen Economy through Advanced Power Electronics

Featured in Frost & Sullivan's *Power Electronics and the Hydrogen Economy* Report , Highlighting TMEIC's High-Performance Power Supply Technologies for Green Hydrogen Production

TMEIC Corporation (President & CEO Akira Kawaguchi; hereinafter "TMEIC" or "the Company") has been prominently featured in Frost & Sullivan's recent white paper, *Power Electronics and the Hydrogen Economy*. The report underscores the vital role of power electronics in enabling large-scale hydrogen production and advancing global decarbonization efforts and recognizes TMEIC as a global leader in the power electronics field.
Full report: https://live-tmeic.pantheonsite.io/wp-content/uploads/2026/01/R07_D01_TMEIC_WP_Hydrogen_082825_MK_KL.pdf

As the global economy advances toward decarbonization and electrification, TMEIC is delivering innovative power electronics solutions across the entire electricity value chain from generation to consumption. In the production stage, PV inverters and STATCOM stabilize output from solar, wind and other renewable sources. Transmission and distribution, battery energy storage systems and related converters absorb fluctuations and contribute to maintaining a steady grid. On the utilization side, high efficiency drives power industrial motors, while low-harmonic, high-power-factor rectifiers provide high-performance DC power for applications such as water electrolysis in green hydrogen production. Further, UPS and multiple power compensator (MPC) systems safeguard critical facilities from power disturbances. Together, these solutions embody TMEIC's visionary Power Electronics in Everything (PEiE) concept.

As hydrogen gains global attention as a key energy source for achieving carbon neutrality, investment is accelerating across the hydrogen value chain. Leveraging its expertise, TMEIC provides advanced power supply solutions to green hydrogen plants. Because electrolyzers are often decentralized assets whose size and location depend on end-user needs and grid capacity, TMEIC offers highly customizable rectifier systems in cabinet and containerized formats, including stackable container solutions that maximize limited space and shorten on-site installation time. These systems are based on a modular architecture of standardized converter and chopper units, enabling scalable plant design, simplified maintenance and high availability. TMEIC's broader power electronics portfolio, spanning renewable integration, grid stabilization, energy storage and backup powers, support optimized electricity supply from generation through to hydrogen production, transportation, storage and end users.

Frost & Sullivan has duly recognized that conventional thyristor-based rectifiers require extra harmonic filters and power-factor correction equipment, which increases both CAPEX and OPEX and makes the overall system more complex. TMEIC's advanced Insulated Gate Bipolar Transistor (IGBT) rectifiers overcome these challenges by inherently producing lower harmonics and maintaining a high-power factor, which can reduce or eliminate the need for external filtering equipment. This streamlined design reduces installation footprint, engineering costs and system

complexity. In addition, TMEIC's rectifiers deliver very low DC ripples, ensuring efficient electrolyzer operation and high hydrogen output.

Since 2023, several hydrogen production demonstration projects have adopted TMEIC's advanced power-supply systems, including PEM, alkaline and SOEC electrolyzer installations, in collaboration with major industrial partners. These projects have operated smoothly to date, demonstrating the reliability and efficiency of TMEIC's IGBT rectifier technology and its flexibility across multiple electrolyzer types. Although many of these projects are currently located in Japan, TMEIC's global network of engineering teams, manufacturing bases, service centers and knowledge hubs enables a rapid response to customer needs and continuous lifecycle support worldwide.

Hydrogen is expected to play a key role in global decarbonization, with substantial infrastructure investment anticipated over the coming decade. Project viability will depend on minimizing capital and operating costs without compromising efficiency. TMEIC recognizes this imperative and is committed to supporting hydrogen infrastructure developers worldwide. Building on proven project experience and its PEiE portfolio, TMEIC is committed to a legacy to deliver high-performance, technology-driven power electronics solutions and to be a trusted partner in enabling a carbon-neutral society.

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