PRESS RELEASE

Horizon's New AEM Electrolyser Technology Brings the World Closer to $1kg Green Hydrogen

Singapore, 27 February 2024

Horizon Fuel Cell is announcing a technology breakthrough on Anion Exchange Membranes that could play a crucial role in realising the targeted $1/kg green hydrogen production cost at scale. Horizon's two decades of membrane technology development helped achieve the breakthrough, in collaboration with partners on base materials and manufacturing processes.

This innovation has the potential to transform green hydrogen into an immediate decarbonisation reality for green steel, green fertilisers, green ammonia, synthetic fuels and hydrogen-electric mobility, and will be introduced at the Horizon booth at the Japan Hydrogen and Fuel Cell Expo from 28 February through 1 March, 2024.

While several hydrogen production technologies have shown promise in recent years, many are proving expensive or unreliable. Horizon has developed a new Anion Exchange Membrane (AEM) material combination that is expected to operate for over 60,000 hours at an efficiency of up to 95%, creating a significant cost advantage compared to other electrolyser systems. Horizon aims to begin delivery of the AEM membrane within months, and expects to deliver MW-scale AEM electrolysers to commercial customers from around the end of 2024.

Horizon's new multi-layered, radical scavenging membrane achieves ion conductivity up to twice that of other products. It demonstrates superior mechanical strength and chemical stability, making it suitable for widespread commercialisation of next generation AEM electrolysers.

AEM technology is emerging as the "best of all worlds" green hydrogen production pathway. It combines the advantages of both Alkaline and Proton Exchange Membrane (PEM) technologies while mitigating many of their drawbacks. It makes use of earth-abundant nickel and iron materials, removes the requirement for expensive Iridium catalysts and titanium plates, and avoids the use of perfluoroalkyl substances (PFAS), which are facing scrutiny through their classification as "forever chemicals".

Horizon's innovation is at heart of AEM electrolysers, combining proprietary anion exchange membranes and catalysts with novel electrode designs, yielding substantially increased ionic conductivity and electrocatalytic efficiency. To date, 95% efficient water electrolysis has been achieved in Horizon's laboratories, demonstrating the feasibility of reducing typical benchmark

electrical consumption of electrolysers by 10-20%. The company had previously filed US Patent Application 2007 / 0275291 relating to a multi-layer membrane electrode structure to achieve high power density for fuel cells and electrolysers.

The company is a recognised technology pioneer in the hydrogen world. It has produced a variety of products and solutions across several industries over the last two decades, created many fuel cell and electrolyser cost/performance benchmarks along the way; and evolved into one of the largest suppliers of hydrogen solutions.

In December 2023, Horizon announced the launch of electrolyser subsidiary in Singapore **HET Hydrogen Pte Ltd**, and has already begun deploying MW-scale PEM electrolysers.

About Horizon Fuel Cell Technologies **www.horizonfuelcell.com**

Horizon Fuel Cell was established in 2003 in Singapore, and has since become a world-leading developer of key technologies across the hydrogen value chain, with more than 1.2GW of Membrane Electrode Assembly (MEA) annual manufacturing capacity set up at two locations, serving the downstream market opportunity for both fuel cells and electrolysers.

For more information visit www.het-h2.com, or email sales@horizonfuelcell.com