

## AFC Energy launches anion exchange membrane hydrogen fuel cell test facility

AFC Energy has released a pre-commercial prototype of its new, high power density HydroX-Cell(S)™ fuel cell system. It maintained the development of its AlkaMem™ anion exchange membrane during Q3/Q4 2020 despite the Covid-19 pandemic. Today it launched its new HydroX-Cell(S)™ Fuel Cell research facility. Initial design work has concluded on the stack design for the "S" Series AEM fuel cell-based upon our scaled-up MEA. The unit's final build will be completed in April and will provide the set-up needed to validate the design criteria for the modular 10 kW HydroX-Cell(S)™ fuel cell stack. It plans to release early commercial-scale HydroX-Cell(S)™ stacks to the market in late 2022 and remains on track to achieve this timeline.

## Air Liquide collaborates with Itochu to scale up Japan hydrogen mobility markets

Air Liquide Japan and Itochu Corporation (Itochu) have signed a memorandum of understanding to collaborate on developing hydrogen mobility markets in Japan. Both partners will initially focus on developing the hydrogen retail infrastructure in Japan, both for passenger vehicles and commercial vehicles' new fleets (trucks, busses). The objective is to expand this retail infrastructure and develop a competitive hydrogen supply offer for passenger and commercial end-users in collaboration with public authorities, allowing a rapid ramp-up of hydrogen mobility in Japan. This collaboration will leverage the expertise and technologies of Air Liquide across the hydrogen supply chain and the large footprint of Itochu Group across multiple energy sectors, from fuel retail business to renewable energy production plants.

## Atos and HDF Energy to develop the first green hydrogen datacenter

Atos and HDF Energy today announce their plan to develop a complete end-to-end long-term solution to supply datacenters with green hydrogen generated by renewable energy, with the aim to demonstrate it in 2023. Atos will provide a complete end-to-end green datacenter solution by designing and providing the hardware, software and integration services that make it possible to exploit the electricity produced by green hydrogen so that it can be used in datacenters. HDF Energy will supply a power plant, which will provide predictable and firm electricity thanks to its high-powered fuel cells. These cells will be powered by green hydrogen derived from photovoltaic or wind farms.

## Canadian company offers hydrogen at 5% below the price of diesel

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## Dutch companies partner to supply hydrogen to one of the first refuelling stations

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## German city to trial Alstom hydrogen-powered train from May

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## Global shipping giant pursues ammonia and biofuel for decarbonisation

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## Green hydrogen makes to MIT Technology Review 10-breakthrough technologies of 2021

MIT Technology Review announced its 10 Breakthrough Technologies list for 2021, featuring ten advances predicted to have a big impact on our lives. These are messenger RNA vaccines, GPT-3, data trusts, lithium-metal batteries, digital contact tracing, hyper-accurate positioning, remote everything, multi-skilled AI, TikTok recommendation algorithms and green hydrogen.

It argued that if made using renewable power, hydrogen could provide a clean and carbon-neutral source of energy and replace the natural gas, diesel, and gasoline used in ships, trucks, buses, and cars. MIT says that the rapidly dropping solar and wind power cost means green hydrogen is now cheap enough to be practical. Europe is leading the way, beginning to build the needed infrastructure. Peter Fairley argues that such projects are just a first step to an envisioned global network of electrolysis plants that run on solar and wind power, churning out clean hydrogen.

## Russia will start producing hydrogen-powered locomotives by 2024

The deputy head of the Russian Ministry of Industry and Trade, Mr Morozov, said that Russia would start producing locomotives based on hydrogen fuel technology by 2024, with heavy vehicles in 2023. The local media channels also reported that Germany's Wintershall Dea is working with Gazprom on hydrogen production technology as part of scientific and technical cooperation.

## Singapore on the look for green hydrogen in Latin America

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## SK Group closes \$1.6B investment in Plug Power to Advance Hydrogen Strategy

SK Group, South Korea's largest energy provider and third-largest conglomerate, today the close of a \$1.6 billion investment and strategic partnership with Plug Power Inc., a leading provider of hydrogen fuel cell and fuelling solutions are enabling e-mobility. SK Group companies already are making strategic investments in their existing energy businesses and forming partnerships with global leaders in hydrogen energy technology. These actions include:

- SK Group closed on its investment and strategic partnership with Plug Power, a company based in Latham, N.Y. Together, the companies plan to provide hydrogen fuel cell systems, hydrogen fueling stations and electrolyzers to Korean and other Asian markets. The investment was valued at \$1.6 billion at signing today.
- SK E&S has established a hydrogen development business, committing to producing 30,000 tons of liquefied hydrogen – utilising product from SK Innovation – each year beginning in 2023, and 250,000 tons of "blue hydrogen" starting in 2025. SK E&S plans to become a global eco-friendly energy company that incorporates renewable energy sources by expanding its business to all areas of the hydrogen ecosystem, including production, distribution and sales.
- SK E&S will use SK Energy's gas stations and truck stops as Green Energy Hubs for hydrogen distribution. By 2025, the company aims to have created 280K tons of supply.

## SunHydrogen announces \$10M registered direct offering

SunHydrogen, Inc, the developer of a technology to produce renewable hydrogen using sunlight and water, today announced that it has entered into a securities purchase agreement with a single institutional investor to purchase 95,238,096 shares of its common stock and warrants to purchase an aggregate of up to 71,428,572 shares of common stock, in a registered direct offering. The combined purchase price for one share of common stock and a warrant to purchase 0.75 of a share of common stock is \$0.105. The warrants have an exercise price of \$0.12 per share, will be immediately exercisable and will expire five years from the issue date