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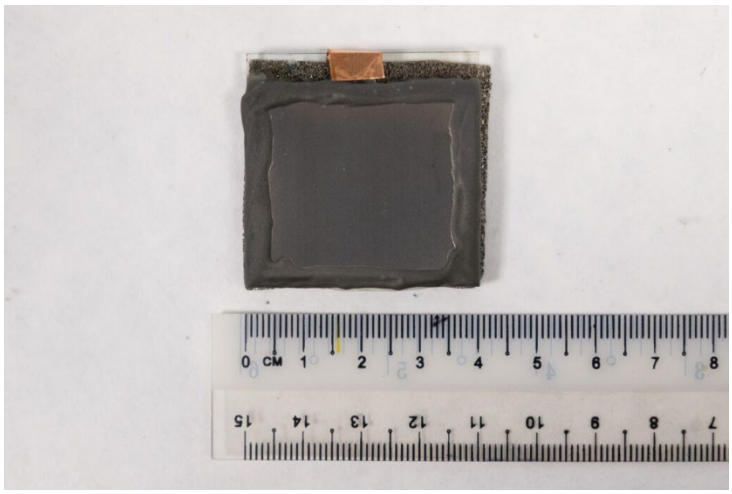
Hydrogen Corner: Singapore researchers unveil artificial leaf to produce hydrogen from contaminated seawater.

Power to Hydrogen has started green hydrogen production in Antwerp, while Dongfeng presented three hydrogen-powered commercial vehicles in Hanover. Denmark also opened the EU's first commercial-scale CO_2 storage site, and H2 Mobility has begun trial operation of a hydrogen refueling station at Hanover Airport.



Artificial leaf uses solar energy to produce hydrogen from contaminated seawater through electrolysis | Image: Nanyang Technological University

Nanyang Technological University has presented what it calls an artificial leaf: a perovskite device that uses solar energy to produce hydrogen from contaminated seawater through electrolysis. The process simultaneously degrades hydrazine, a highly toxic contaminant found in industrial wastewater. "We designed the anode with a catalyst that splits hydrazine into hydrogen and nitrogen. At the same time, the formation of corrosive and toxic chlorinated compounds from seawater is suppressed," explained the research team led by Lydia Wong. The cathode was made with lead halide perovskites, which capture light and convert it into electricity. The photocurrent density, or the amount of current generated per illuminated area of the device, was among the highest ever reported for lead-based perovskite cathodes. The device maintained stable performance for over 72 hours under illumination equivalent to the intensity of solar radiation reaching the Earth's surface on a clear day, generating hydrogen at a rate

comparable to that of similar solar devices, the researchers added. The results are presented in the study " Self-powered artificial leaf using perovskite photocathode for solar hydrogen production and hydrazine degradation ," published in Nature Communications.

Power to Hydrogen (P2H2) has begun commercial production of green hydrogen at the NextGen District of the Port of Antwerp-Bruges. The 500 kW plant, consisting of two 250 kW stacks and delivered to the site in August, would represent the first commercial installation of a 250 kW anion exchange membrane (AEM) stack. According to the U.S. electrolyzer developer, the stack size is more than ten times larger than that of the stacks used in conventional AEM systems. "Now operational, the system will initially produce up to 70 tons of green hydrogen per year for the regional gas supplier Holthausen and other customers in the area. The hydrogen will primarily be used by mobility customers, with additional potential for industrial use," the Ohio-based company stated.

Dongfeng Motor Group unveiled three hydrogen-powered vehicles at an industry trade fair in Hanover, Germany: a long-distance logistics workhorse, a dual-fuel electric-hydrogen truck, and an intercity truck for cold chain deliveries. The vehicles are based on a platform equipped with a 400 kW hydrogen fuel cell stack with an efficiency of over 58%. The system is expected to achieve hydrogen consumption of up to 7 kg per 100 km, while the vehicles' curb weight starts at 8.8 tons.

The European Union's first commercial-scale CO_2 storage site was officially inaugurated in Denmark. The Danish king inaugurated the Greensand storage facility, led by Ineos Energy in partnership with Harbour Energy and the Danish North Sea Fund (Nordsøfonden). "Greensand plans to store up to 400,000 tonnes of CO_2 annually in this first commercial phase, with a potential growth of 4-8 million tonnes annually at full capacity," Ineos stated.

H2 Mobility has begun trial operation of its new hydrogen refueling station at Hannover-Langenhagen Airport in Germany. The site can now refuel both commercial vehicles and passenger cars. "Schreck + Batz Logistik, a logistics company based in Langenhagen, has received a hydrogen truck for testing," announced H2 Mobility, which develops, builds, and operates hydrogen refueling infrastructure for all vehicle classes.

https://www.pv-magazine.it/2026/09/21/the-hydrogen-stream-singapore-researchers-present-artificial-leaf-for-h2-production-from-contaminated-seawater/