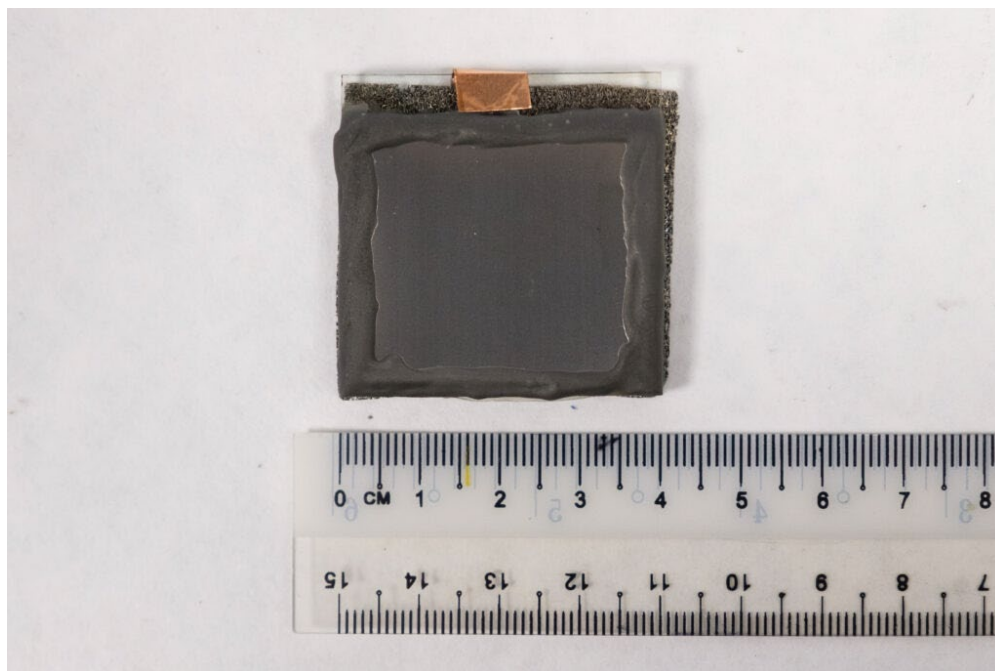


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The Hydrogen Stream: Singapore researchers present artificial leaf for H₂ production from contaminated seawater

In other news, Power to Hydrogen started green hydrogen production in Antwerp, while Dongfeng unveiled three hydrogen-powered commercial vehicles in Hannover. Moreover, Denmark opened the EU's first full-scale CO₂ storage site, and H₂ Mobility began trial operations at a hydrogen refueling station at Hannover Airport.



The artificial leaf uses solar energy to produce hydrogen from contaminated seawater via electrolysis. | Image: Nanyang Technological University

Nanyang Technological University has unveiled what it calls an artificial leaf – a perovskite device that uses solar energy to produce hydrogen from contaminated seawater via electrolysis. The process simultaneously degrades hydrazine, a highly toxic contaminant found in industrial wastewater. “They designed the anode with a catalyst that breaks down hydrazine into hydrogen and nitrogen. At the same time, the production of corrosive and toxic chlorine compounds from seawater is suppressed,” said the research team, led by Lydia Wong. The researchers fabricated the cathode from lead halide-based perovskites that capture light and convert it into electricity. “The photocurrent density – the amount of current generated per illuminated area of the

device – was one of the highest reported for lead-based perovskite cathodes. The device maintained stable performance for more than 72 hours under illumination equivalent to the intensity of sunlight reaching the Earth's surface on a clear day, generating hydrogen at a rate comparable to similar solar-powered devices," they said. The researchers presented their findings in "Self-powered artificial leaf using perovskite photocathode for solar hydrogen production and hydrazine degradation," published in nature communications.

Power to Hydrogen (P2H2) has started commercial green hydrogen production in the NextGen District at the Port of Antwerp-Bruges. The 500 kW system, comprising two 250 kW stacks and delivered to the site in August, is reportedly the first commercial deployment of 250 kW anion exchange membrane (AEM) stacks. The US electrolyzer developer said the facility is more than 10 times larger than the stacks used in conventional AEM systems. "Now operational, the system will initially produce up to 70 tonnes of green hydrogen per year for regional gas supplier Holthausen and other customers in the area. The hydrogen will be used mainly for mobility customers, with other industrial use cases as an additional potential offtake," the Ohio-based company said.

Dongfeng Motor Group has presented three hydrogen-powered vehicles at a trade fair in Hannover, Germany: a workhorse for long-haul logistics, a dual electric-hydrogen truck, and an intercity truck for cold-chain deliveries. The vehicles are based on a platform featuring a 400 kW hydrogen fuel cell stack with efficiency of more than 58%. The system reportedly achieves hydrogen consumption as low as 7 kg per 100 km, while the vehicles have a curb weight starting at 8.8 tonnes.

The European Union's first full-scale CO₂ storage site has officially opened in Denmark. The country's king inaugurated the Greensand CO₂ storage facility, which is led by Ineos Energy in partnership with Harbour Energy and the Danish North Sea Fund (Nordsøfonden). "Greensand expects to store up to 400,000 tonnes of CO₂ annually in this first commercial phase, scaling toward a potential of up to 4 million to 8 million tonnes annually at full capacity," said Ineos.

H2 Mobility has started trial operations at its new hydrogen refueling station at Hannover-Langenhagen Airport in Germany. Commercial vehicles and passenger cars can now refuel at the site. "Schreck + Batz Logistik, a logistics company based in Langenhagen, took delivery of a hydrogen truck for testing purposes," said H2 Mobility, which develops, builds, and operates hydrogen refueling infrastructure for all vehicle classes.

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