

Q3/2025

October 2025

HYDROGEN & DERIVATIVES MARKET REVIEW

The summer of 2025 reshaped global hydrogen and ammonia markets. U.S. policy shifts slowed growth, Europe advanced refinery-linked projects, and India's auctions set new cost benchmarks. China's Chifeng complex confirmed Asia's cost edge, while data-centre fuel cells opened a new growth avenue.



Introduction

The summer quarter of 2025 was marked by a convergence of geopolitical, industrial, and policy shocks that reshaped the trajectory of the global hydrogen and ammonia sectors. Across markets, three developments defined the quarter: regulatory disruption in the United States, an acceleration of electrolyzer investment decisions in Europe's refinery sector, and India's landmark green-ammonia auctions. The opening of Envision Energy's Chifeng complex, now the world's largest green-ammonia facility, provided an additional symbolic turning point, signalling a shift of cost leadership towards Asia. A striking new driver also emerged during the quarter: the intersection between data centres, natural-gas supply, and solid oxide fuel-cell (SOFC) deployment. Large technology firms and utilities are increasingly exploring SOFCs for grid-independent, high-efficiency power supply at data-centre clusters, creating the first scalable commercial case for the technology. As a result, the stock prices of leading companies such as Bloom Energy and Ceres Power surged in recent months, with Bloom's shares rising modestly in Q3 and Ceres advancing by nearly 70 percent over the same period, continuing their broader year-to-date gains.

India's first large-scale green-ammonia auction round in Q3 2025 demonstrated how a favourable regulatory environment can accelerate cost competitiveness. The Indian government's definition of "green hydrogen"—with an emission threshold of 2 kg CO₂-equivalent per kg H₂, measured as a 12-month average—contrasts sharply with the European Union's RFNBO framework, which requires monthly correlation of renewable inputs until 2030 and hourly correlation thereafter. This distinction allows Indian developers to operate electrolyzers in semi-baseload mode, effectively "banking" grid renewables and reducing capital costs, while EU projects must oversize capacity for intermittent supply, inflating capex. Winning bids ranged from US \$568 – 740 per tonne on a 10-year fixed basis. The lowest bids near US \$600 per tonne are only around US \$200 above imported grey ammonia. According to available Trade Data, India imported roughly 2.3 million tonnes of ammonia in 2023 (\approx US \$1.3 billion value), primarily from the Middle East and Southeast Asia, making domestic substitution both a clean-energy and trade-balance intervention.

Auctioned volumes vs 2023 imports



Source: Delphi Data Labs



Producer	Tons per year renewable ammonia	Delivery point	Delivery price (\$US/ton)	Total Contract Volume (10-Year Period, \$US)	Likely production project location	Approx. distance between production and delivery (km)
ACME Cleantech	20,000	Indorama India (Haldia, West Bengal)	735	147,000,000	Gopalpur, Odisha	550 (road); 500 (shipped to Haldia)
ACME Cleantech	25,000	Paradeep Phosphate (Zuarinagar, Goa)	713	178,250,000	Mangaluru, Karnataka	300 (shipped to Mormugoa Port)
ACME Cleantech	75,000	Paradeep Phosphates (Paradeep, Odisha)	633	474,750,000	Gopalpur, Odisha	170 (road); 300 (shipped via Paradeep Port)
ACME Cleantech	100,000	Coromandel International (Vishakhapatnam, Andhra Pradesh)	589	589,000,000	Gopalpur, Odisha	300 (road); 300 (shipped via Vishakhapatnam Port)
ACME Cleantech	100,000	IFFCO (Kandla, Gujarat)	621	621,000,000	Mangaluru, Karnataka	1,500 (shipping plus road)
ACME Cleantech	100,000	IFFCO (Paradeep, Odisha)	565	565,000,000	Gopalpur, Odisha	170 (road); 300 (shipped via Paradeep Port)
Jakson Green	85,000	Coromandel International (Kakinada, Andhra Pradesh)	576	489,600,000	Announced projects in Rajasthan and Kandla Port, Gujarat	3,500 (shipping plus road)
NTPC Renewable Energy	70,000	Krishna Phoschem (Meghnagar, Madhya Pradesh)	588	411,600,000	State of Maharashtra	200-300 (road)
Onix Renewables	50,000	Gujarat Narmada Valley Fertilizers & Chemicals (Bharuch, Gujarat)	596	298,000,000	No announced production projects	No announced production projects
Oriana Power	60,000	Madhya Bharat Agro Products Unit 2 (Sagar, Madhya Pradesh)	593	355,800,000	No announced production projects	No announced production projects
SCC Infrastructure	15,000	Mangalore Chemicals & Fertilizers (Mangaluru, Karnataka)	654	98,100,000	No announced production projects	No announced production projects
SCC Infrastructure	70,000	Madhya Bharat Agro Products Unit 3 (Dhule, Maharashtra)	602	421,400,000	No announced production projects	No announced production projects
Suryam International	4,000	Madras Fertilizers (Chennai, Tamil Nadu)	568	22,720,000	No announced production projects	No announced production projects
Total/Average/Total	724,000		618	4,672,220,000		

In the United States, by mid-2025, the Trump administration had executed significant funding cuts to clean-hydrogen initiatives. In June, the Department of Energy (DOE) began scaling back several regional hydrogen-hub commitments, and by October 2025 approximately US \$7.6 billion in grants for hydrogen and other clean-energy projects had been formally cancelled. Independent reviews found that the DOE's Hydrogen Hub Office lacked adequate staffing and risk controls, prompting Congressional scrutiny and delaying multiple project pipelines. While the statutory Inflation Reduction Act credits remain in place, these actions have introduced substantial regulatory risk. Developers now face uncertainty over both federal cost-sharing and long-term eligibility under Section 45V, shifting the U.S. hydrogen investment environment from policy-driven expansion to a phase of reevaluation and consolidation. The cancellations affect 321 financial awards supporting 223 projects, crushing the American Cleantech Ecosystem.



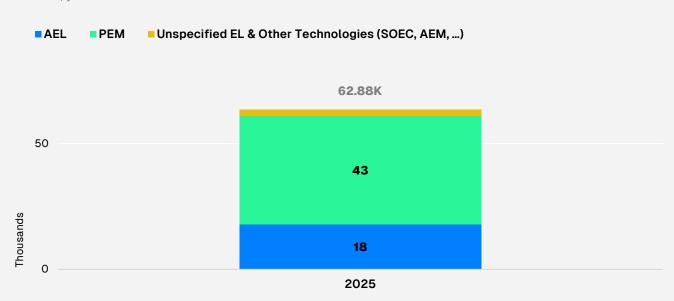
Europe's refinery sector has shown growing decisiveness. Several large-scale electrolyzer investments achieved Final Investment Decision (FID) status through Q3 2025, underscoring a strategic pivot from feasibility to deployment. Key milestones include the FID of Repsol in Cartagena, the start of construction at OMV's 140 MW plant and Air Liquide's 200 MW ELYgator at Rotterdam.

These and other projects, collectively exceeding 450 MW, indicate that industrial hydrogen demand in refining is moving from pilot scale to committed decarbonization pathways. The European electrolyzer supply chain, spanning stack manufacturing and balance-of-plant engineering, is now entering a capacity-ramp phase.

It is also worth mentioning, that two thirds of the European projects in construction are PEM technology, a stark contrast to the Asian Market, in which the vast majority of projects under construction are Alkaline electrolyzers.

FIDs by specific technology in Europe





Source: Delphi Data Labs

The commissioning of Envision Energy's 500 MW Chifeng Green Ammonia Plant in Inner Mongolia set a new global benchmark for scale and cost efficiency. According to Chinese analyst Yuki Yu, the facility could potentially achieve production costs below those of India's best auction bids, positioning China as a low-cost exporter of green ammonia. If verified, this would make Chifeng the first facility globally capable of producing fully renewable ammonia at sub-US \$600 per tonne on a commercial basis.





584

Total number of GW with existing FID since 2021:

29.90

Total number of tons with existing FID since 2021:

7.85M

All Clean Hydrogen FIDs by major technology

(tons H2)





All Clean Hydrogen FIDs by region

(tons H2)

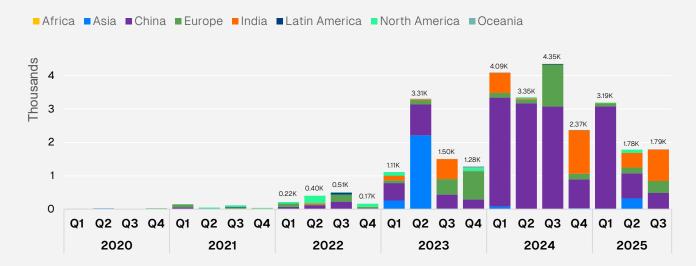


Source: Delphi Data Labs



All Clean Hydrogen Electrolyzer FIDs by region

(MW)

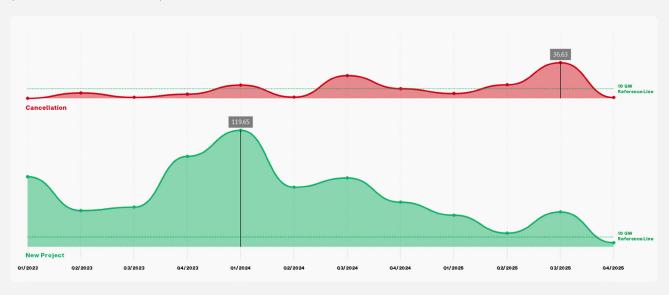


Source: Delphi Data Labs

Since 2023, 1,537 clean hydrogen projects have been announced (626 GW), while 149 projects (115 GW) have been cancelled or paused. Despite this, new announcements continue to outpace cancellations, reflecting a maturing and resilient market. Early speculative ventures are being replaced by more robust projects, especially derivatives like e-methanol, SAF, and ammonia, with stronger carbon sourcing strategies. Even amid negative sentiment in Q3 2025, new announcements have matched or exceeded cancellations.

Project Announcements vs. Cancellations

(2023 - 2035 COD Horizon)



Source: Delphi Data Labs

Note: Each data point represents the aggregate electrolyzer capacity (GW) of projects disclosed in the respective quarter, allowing comparison between market optimism (announcements) and attrition (cancellations). The chart does not specify exact commissioning years; all included projects share a targeted COD before the end of 2035.



an Al-powered B2B industrial news publishing platform in its early alpha stage

Theia consolidates reporting across a wide range of industrial segments, offering a **clear, concise,** and high-signal view of ongoing developments.

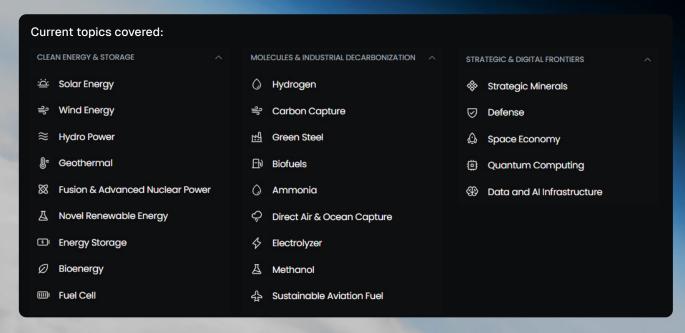
Theia's core mission is to reduce the noise in B2B publishing — filtering out advertisements, scattered content across different media outlets, and unnecessary length — to focus on what truly matters:

the key market signals shaping global industries.

The platform is **free to use**, with no sign-up required for general access. Registered users can create customized feeds to follow the industrial sectors most relevant to them.

This early version marks the beginning of a longer journey. New features will be added over time, and readers are invited to **explore the platform, test its capabilities, and share feedback** to help shape the future of B2B media.

Visit: theianews.com





Project Updates

Europe & Africa

- / Air Liquide: Reached FID on 200 MW ELYgator electrolysis plant in Maasvlakte, Port of Rotterdam.
- E.ON: Cancelled its 20 MW HydroHarbourEssen project and withdrew from the H2.Ruhr pipeline consortium, shifting focus from hydrogen production and infrastructure toward bespoke B2B hydrogen solutions and integrated decarbonisation services for industrial clients.
- / **EDP:** Produced and injected first hydrogen molecule into gas turbine at Ribatejo power plant in Lisbon as part of the EU FLEXnCONFU project.
- / **Electrum & Rafineria Gdańska:** Signed contract for turnkey 5 MW electrolyzer project at Gdańsk Refinery, Poland.
- / Elogen & CrossWind: Delivered 2.5 MW electrolyzer for innovative energy hub in the Netherlands.
- / Entega & Fest GmbH: Awarded contract for a 3 MW electrolyzer with compressor and hydrogen trailer filling station at the Darmstadt waste-to-energy plant, scheduled for operation in early 2027. The facility will produce about 310 t of green hydrogen annually to fuel around 40 buses as part of the €100 million (\$116.6 million) DELTA real-world laboratory coordinated by TU Darmstadt and funded by Germany's Federal Ministry for Economic Affairs and Energy.
- / ErreDue & Groengas Asset BV: Signed a €3.2 million (\$3.7 million) contract to supply three hydrogen production plants totaling 2.5 MW for hydrogen mobility applications in the Netherlands. Scheduled for commissioning by March 2026, the units will produce over 500 t H2/year from renewables across Amsterdam and Groningen.
- / **Everfuel:** Secured RFNBO certification for green hydrogen produced at its 20 MW HySynergy 1 plant in Frederica, Denmark, enabling supply to industrial and transport customers across Denmark, Germany and northern Europe in compliance with EU RED III mandates.
- / **Gasunie:** Converting natural gas pipeline in Bremen to hydrogen as part of the Hyperlink project, integrating into Germany's core network by 2027.
- / **Hy2B Wasserstoff:** Received RFNBO certification for its 5 MW green hydrogen plant in Pfeffenhausen, Bavaria, confirming 99.9% lower CO₂ emissions than fossil fuels and enabling supply to industrial and transport customers under EU Renewable Energy Directive quotas.
- / **Hydrogen Adige Valley:** Began construction of a €14 million (\$16.3 million), PNRR-backed 5 MW green hydrogen plant in Bolzano South, designed to produce 2,500 kg H2/day to fuel SASA's public bus fleet, with on-site storage and refuelling infrastructure.
- Hydropulse (ITM Power) & ABO Energy: Partnered to build decentralized green hydrogen plants in renewables-rich regions of Europe.



- / ITM Power & MorGen Energy: Signed supply and services agreement for 20 MW West Wales Hydrogen project.
- / Kyros & Enertrag: Delivered 4 MW electrolysis plant to fuel Heidekrautbahn hydrogen trains in Germany.
- Libya & H2 Global: Partnered to develop a large-scale green hydrogen project targeting 1 million t/year for export, expected to create 10,000 jobs and accelerate Libya's renewable energy transition.
- Lhyfe & Essent: Delivered green hydrogen to Bosch's new Deventer testing centre for hydrogen-ready boilers under the GROHW project, one of the Netherlands' first implemented green hydrogen initiatives aimed at reducing CO2 emissions.
- / **Metacon & Elektra Power:** Awarded a €7.1 million (\$8.3 million) contract to deliver a 7.5 MW green hydrogen plant in Romania, integrating pressurised alkaline electrolyzers from partner Peric.
- / MT Group & IMI: Awarded contract for 3 MW PEM electrolyzer at Vilnius Green Hydrogen Production facility in Lithuania.
- / **Namibia:** Inaugurated its first integrated green hydrogen production and refuelling facility in Walvis Bay, featuring a 5 MW solar-powered electrolyzer supplying hydrogen to dual-fuel vehicles and, from 2026, a hydrogen-powered train.
- / NaTran, Teréga & Enagás: Formed a joint venture to develop the BarMar hydrogen pipeline linking Barcelona and Marseille, a key part of the H2Med corridor connecting Spain, France and Germany by 2030. The EU-backed project, co-funded under the Connecting Europe Facility, will transport up to 10% of Europe's hydrogen demand.
- / **OMV & Siemens Energy:** Began construction of a €700 million (\$816 million), 140 MW electrolysis plant in Bruck an der Leitha, Lower Austria, one of Europe's largest. The facility will produce up to 23,000 t/year of green hydrogen from 2027, supplying OMV's Schwechat refinery via a 22 km pipeline.
- / Port Authority of Alicante: Launched a market consultation for a 1 MW green hydrogen plant in Spain, seeking private partners to finance, build and operate the project under concession by September 30.
- / Repsol: Cancelled its 130 MW Puertollano green hydrogen project in Spain due to technical and economic infeasibility, while planning to take final investment decisions by mid-2026 on three new projects totaling 350 MW in Cartagena, Bilbao and Tarragona. The €1.3–1.4 million (\$1.5–1.6 million)/MW developments target a combined capacity of 600–700 MW across Repsol's refineries by 2030, supported by EU Innovation Fund subsidies.
- / **RWE:** Withdrew from the \$10 billion Hyphen green ammonia project in Namibia, originally intended to supply 300,000 t/year of ammonia from 2027.
- Scottish Power: Cancelled its UK green hydrogen projects in Whitelee and Cromarty despite securing government subsidies, citing challenging market conditions and limited commercial viability, while reaffirming



focus on large-scale electrification and renewable infrastructure investments.

- / SHS Group & Verso Energy: Signed long-term contract for annual supply of 6,000 t green hydrogen for steelmakers Dillinger, Saarstahl and ROGESA.
- / Siemens Energy & Air Liquide: Delivered the first nine of 12 PEM electrolyzers for the 200 MW Normand'Hy project in Port-Jérôme, France. The €400 million (\$466 million) IPCEI-backed plant will start operations in 2026, producing 28,000 t/year of green hydrogen for transport and industrial use.
- / SSE: Took final investment decision on the €300 million (\$349.7 million), 170 MW Platin Power Station in County Meath, Ireland, designed to operate on Hydrotreated Vegetable Oil and natural gas, with future capability for 100% hydrogen conversion.
- / Statkraft: Secured land for 400 MW green hydrogen and ammonia project on Scottish island.
- / **SunsHyne Corridor:** Completed feasibility study for a 3,400 km hydrogen pipeline connecting North Africa to Central and Western Europe, designed to import around 450 GWh/day of hydrogen and address Germany's growing demand exceeding 100 TWh by 2030, with operations targeted for 2030.
- Vattenfall & CIP: Scaled down the Zeevonk green hydrogen project in the Netherlands from 1 GW to 500 MW and delayed completion to the early 2030s due to the postponed Delta Rhine Corridor pipeline. The revised plan includes reduced offshore solar and phased wind capacity, with adjusted financial terms to maintain project viability

Americas

- / **Ecopetrol:** Supporting Colombia's national efforts to strengthen hydrogen regulation and low-emission certification, while advancing the 5 MW Coral project in Cartagena to produce 800 t/year of green hydrogen.
- / Energy Vault & PG&E: Commissioned the Calistoga Resiliency Center in California, the world's first hybrid hydrogen-battery microgrid. The 8.5 MW / 293 MWh system provides up to 48 hours of zero-emission backup power during wildfires, combining hydrogen fuel cells with lithium-ion batteries for long-duration energy storage.
- **Fortescue:** Paused new green energy developments in the United States, including its Arizona Hydrogen project, following legislation phasing out renewable incentives.
- / **H2Atacama:** Commissioned the world's first solar-powered desert hydrogen refinery in the Atacama Desert, using thermocatalytic solar reactors to extract moisture from air and produce green hydrogen without electrolysis. The project supports Chile's \$24 billion hydrogen strategy targeting 300 GW renewables by 2050 and production costs as low as \$0.8-1.0/kg by 2030.
- / **Plug Power:** Extended its hydrogen supply agreement with a leading U.S. industrial gas company through 2030, securing liquid hydrogen for its applications business while reducing costs and improving cash flow



amid plans to expand production and launch over 40 new sites in 2025.

- / **Primary Hydrogen:** Launched Phase 2 hydrogen sampling at Crooked Amphibolite, Coquihalla, and Cogburn projects in British Columbia.
- / **Thyssenkrupp Nucera:** Announced it is abandoning U.S. green hydrogen projects no longer deemed feasible following policy and tax credit changes under the Trump administration
- / Woodside: Exited its proposed H2OK green hydrogen project in Oklahoma, citing cost escalation and weak demand in the US hydrogen market. The decision, resulting in a \$140 million loss, reflects the company's shift away from lower-carbon projects amid reduced federal support for renewable energy investments.

Asia & Oceania

- ACWA Power, PowerChina & Longi: Commissioned Uzbekistan's first green hydrogen plant in Chirchiq, a 20 MW facility producing 3,000 t per year of renewable hydrogen to replace grey hydrogen in fertiliser production. The project, backed by the EBRD and Canada's climate fund, marks Central Asia's first operational green hydrogen site.
- / **BP:** Abandoned plans to invest in the \$54 billion Australian Renewable Energy Hub in the Pilbara, Western Australia, withdrawing from one of the country's largest proposed green hydrogen and ammonia projects to refocus on oil and gas investments.
- China Huadian Group: Began construction of a 295 MW green hydrogen-to-methanol project in Tieling, Liaoning Province, using 450 MW of wind power to produce 19,000 tonnes of hydrogen and 100,000 tonnes of green methanol per year, while its subsidiary China Huadian Corporation issued a tender to build a 195 km hydrogen pipeline in Inner Mongolia designed to transport 100,000 tonnes of hydrogen annually and reduce transportation costs by around 80%.
- / **DEWA:** Announced that its Green Hydrogen project has produced over 100 tonnes of green hydrogen since operations began in May 2021.
- Goldwind Technology: Announced an \$82m wind-powered hydrogen project in Xing'an League, Inner Mongolia. The first phase includes a 32-unit electrolyzer system with an annual capacity of 10,000 tonnes of hydrogen, scheduled to begin operations in June 2026.
- / Guofu Hydrogen: Signed an agreement to build a ¥5 billion (\$701 million) green hydrogen and liquefaction complex in Siziwang Banner, Inner Mongolia. The 300 MW project will deploy 60 in-house electrolyzers powered by 1 GW of renewable electricity, produce 40,000 tonnes of hydrogen annually, and integrate a 120 t/day liquefaction unit and national liquid hydrogen logistics hub.
- / **Hyundai E&C:** Completed South Korea's first commercial water electrolysis hydrogen plant at the Buan-gun Renewable Energy Complex in North Jeolla Province. The facility will produce over one tonne of hydrogen per day from 2026, supporting local fuelling infrastructure and the Buan Hydrogen City initiative.



- / **Jilin Electric Power:** Prepared to start production at its green hydrogen and ammonia facility in Da'an City, Jilin Province, with an expected annual output of 32,000 tonnes of hydrogen and 180,000 tonnes of ammonia.
- Jordan & UEG: Signed MoU for \$1.155 billion green hydrogen project feasibility study, targeting 200,000 t/ year green ammonia for export using desalinated seawater and renewables.
- / **MyFarm Investments & Hiringa Energy:** Partnered to build five 5 MW solar farms in New Zealand to power electrolyzers for hydrogen supply to heavy transport under 10-year PPA.
- / **Ocior Energy & HPCL:** Secured bid to supply 5,000 t/year green hydrogen to Hindustan Petroleum's Visakhapatnam refinery in Andhra Pradesh.
- / **Pertamina Geothermal Energy:** Launched a pilot green hydrogen project in Ulubelu, Lampung, producing around 100 kg of hydrogen per day from geothermal energy.
- / **PETRONAS, TNB & Terengganu Inc:** Launched the Hybrid Hydro Floating Solar project and Green Hydrogen Hub in Terengganu to integrate renewable power with hydrogen, methanol, and ammonia production under Malaysia's National Energy Transition Roadmap.
- / **Provaris Energy:** Cancelled its 2.4 GW Tiwi Islands solar-to-hydrogen project in Australia, which aimed to produce 90,000 tonnes of hydrogen annually for export to Asia, citing unresolved land agreements and declining offtake interest from Singapore.
- / **Rockcheck Group:** Signed a three-way agreement with Baotou's Jiuyuan District government and Huadian Hydrogen Energy to deploy 1,000 hydrogen fuel-cell heavy-duty trucks in Inner Mongolia by 2026, supported by integrated wind- and solar-powered hydrogen production, refuelling, and logistics infrastructure.
- / **Singareni Collieries Company Limited (SCCL)**: Approved plans to build a green hydrogen plant in Ramagundam, India, targeting daily production of 5 tonnes following a positive feasibility report.
- / Thyssenkrupp Materials Trading & Progressive Green Solutions: Signed an MoU for the full offtake of green iron products from the planned 1.4 GW Mid-West Green Iron project in Western Australia, which will use Thyssenkrupp Nucera electrolyzers to produce hydrogen for low-carbon HBI and iron pellets.
- TKIL Industries & SoHHytec: Formed a partnership to establish a green hydrogen plant in India by 2026 using SoHHytec's artificial photosynthesis technology, with TKIL serving as EPC contractor and exclusive Indian partner for equipment manufacturing and project execution.
- / **Torrent Group:** Commissioned Uttar Pradesh's first green hydrogen plant in Gorakhpur, producing 72 tonnes per year to be blended with natural gas via Torrent Gas' city distribution network, marking India's largest hydrogen-natural gas blending project.



Electrolyzer OEMs & Startups

Europe & Africa

- / **AEG Power Solutions & Exion Hydrogen:** Completed Factory Acceptance Test for a 3 MW power rectifier supporting Exion's pressurized alkaline and PEM electrolyzer systems, produced for deployment at the company's hydrogen facilities in Poland.
- / Asahi Kasei & Cefmof: Supplying 1 MW Aqualizer™ C3 alkaline electrolyzer for Central Finland hydrogen production, with commissioning scheduled for H1 2026.
- / **Bosch & Kyros Hydrogen:** Prepared 1.25 MW Hybrion PEM stack for Kyros Hydrogen Solutions waste management project.
- / **Cavendish Renewable Technologies:** Launched hybrid electrolysis platform combining solid oxide and alkaline technologies to address green hydrogen adoption barriers.
- / **De Nora:** In final field-testing phase of its new Dragonfly pressurised alkaline electrolyzer, which is the company's first fully turnkey system.
- / Elcogen: Opened new European solid oxide fuel cell factory, scaling capacity from 10 MW to 360 MW.
- / **Enapter:** Expanded portfolio with 2.5 MW Nexus 2500 multicore electrolyzer, doubling output vs 1 MW units within same 40-foot container footprint.
- / **HyGear, EPFL & SolydEra:** Installed an advanced solid oxide electrolyzer at Gaznat's Innovation Lab in Aigle, Switzerland, capable of producing 100 kg of hydrogen per day and switching between electrolysis and fuel cell modes to enable flexible energy management for research and renewable integration.
- / **Hygreen Energy & Bosch:** Partnered to integrate Bosch's PEM electrolyzer stacks into Hygreen's hydrogen production systems.
- / **IMI & Polytec Energy:** Supplying 1 MW PEM Vivo electrolyzer to replace fossil fuels in industrial processes in northern Italy.
- / ITM Power & RWE: Entered capacity reservation agreement for 150 MW of NEPTUNE V units.
- / **Sungrow:** Opened a hydrogen technology laboratory in Munich, Germany, dedicated to R&D in electrolytic hydrogen production and power-to-X applications, featuring advanced testing, digital simulation, and materials analysis facilities.
- / **Trina Green Hydrogen:** Shipped its first containerized megawatt-scale electrolyzer system from China to Europe, marking a milestone in the company's full-process delivery capability.



Americas

- Accelera (by Cummins): Delivered its largest electrolyzer system to date, a 35 MW PEM unit for Linde's green hydrogen facility in Niagara Falls, New York, powered by renewable hydroelectric energy to produce zero emission hydrogen for industrial decarbonisation and regional clean energy development.
- / **Electric Hydrogen:** Selected by HIF Global to supply PEM electrolyzers for the 1.8 GW Matagorda e-fuels project in Texas, which will produce around 1.4 million tonnes of synthetic fuels per year once operational.
- / H2Brazil: Dropped plans to use solid oxide electrolyzers for its €1.3 billion (\$1.52 billion) H2X Minas Gerais project in Uberaba, Brazil, opting instead for alkaline technology to accelerate deployment and meet international demand. The 820 MW plant will produce 125,000 t/y of green hydrogen for conversion into 700,000 t/y of green ammonia, targeting first operation in 2027 and full capacity by 2030.
- / Mingyang Hydrogen Energy: Expanded into Brazil with two supply contracts totalling 100 MW of green hydrogen production capacity, including a 20 MW deal with Qair Brasil for the H2BRASIL project in Ceará and an 80 MW alkaline electrolyzer agreement with Green World Energy Hydrogen in Mato Grosso do Sul.
- Ohmium International: Unveiled its Lotus Mark 3 PEM electrolyzer featuring a compact 29.7 m2/MW footprint that reduces land, installation, and O&M costs through an integrated design including power distribution, water treatment, and cooling systems.

Asia & Oceania

- / **HydrogenPro & Thermax:** Formed a strategic partnership to localize and scale alkaline water electrolysis solutions for India's green hydrogen market.
- / **JERA & DENSO:** Launched Japan's first demonstration of solid oxide electrolysis hydrogen production at JERA's Shin-Nagoya Thermal Power Station using a 200 kW system developed by DENSO.
- KITZ: Debuted its first made-in-Japan PEM electrolyzer, the KHG-PX100, capable of producing 100 Nm3/h of ultra-pure hydrogen for Japan's domestic renewable hydrogen market. The 700 kVA skid-mounted system integrates electrolysis, purification, and control modules and marks KITZ's expansion from valve manufacturing into turnkey hydrogen production solutions.
- / **Sany Hydrogen Energy:** Pre-won the bid to supply 1,000 Nm3/h alkaline and 200 Nm3/h PEM electrolysis systems for the 200 MW Zaoyang photovoltaic-hydrogen project in Hubei Province, China. The ¥23.3 million contract includes full design, manufacturing, and installation of integrated hydrogen production systems.
- Sungrow & United Engineering Services: Signed a memorandum of understanding to establish a hydrogen electrolyzer manufacturing facility in Oman, which will produce electrolyzers, gas separation systems, and related infrastructure for domestic and regional markets. The partnership follows Sungrow's earlier contract to supply 5 MW alkaline electrolyzers to ACME Group's 320 MW green hydrogen and ammonia project in Oman.
- / Thyssenkrupp Nucera & Progressive Green Solutions: Selected as preferred supplier for gigawatt-scale green iron project in Australia.



Other Hydrogen & Derivatives Technologies

Europe & Africa

- / Air Liquide & H2 MOBILITY: Signed multi-year contract to supply renewable hydrogen in Germany's Rhine-Ruhr region, supporting climate-neutral mobility in North Rhine-Westphalia.
- **AVEVA & Protium:** Formed partnership to accelerate innovation in green hydrogen development and digital integration.
- Cleanergy Solutions Namibia: Announced a N\$50 billion green ammonia project near Walvis Bay, targeting 200,000 tonnes of ammonia production per year in Phase 1, aiming to establish Namibia as a global hydrogen hub.
- / Cummins: Launched hydrogen internal combustion engine turbochargers for on-highway applications.
- / **Egypt, Eni & UNIDO:** Announced a biogas project in Beni Suef Governorate to convert agricultural and animal waste into renewable energy. The facility, developed with the Biogas Energy Foundation, will process 134 tonnes of waste per day to produce 5,000 m3 of biogas, supporting Egypt's national strategy for sustainable waste management and clean energy generation.
- / **EnergyPathways & Hazer Group:** Signed a UK-exclusive MoU to develop a 90 MW methane pyrolysis hydrogen plant as part of the MESH integrated energy storage project, targeting annual production of 20,000 tonnes of hydrogen and 60,000 tonnes of synthetic graphite.
- Guttroff GmbH: Began construction of 5 MW electrolyzer and hydrogen refuelling station in Dettelbach, Germany, supported by \$7.63m state funding.
- / **H2 Power n Heat & H2 Core Systems:** Installed hydrogen fuel cells at the Ausbüttel waste management facility in Gifhorn, Germany, as part of a hybrid solar-hydrogen energy system designed to meet 90% of the site's power demand. The system includes two 90 m3 hydrogen tanks, electrolyzers for on-site production and fuel cells delivering 5-8.6 kW of clean backup power, showcasing decentralized renewable energy integration.
- Hitachi Energy, Air Products & Dura Vermeer: Demonstrated a zero-emission construction site in Rotterdam using Hitachi Energy's HyFlex hydrogen-powered generator to charge a battery-electric excavator, replacing diesel generators with a clean, noise-free alternative. The system converts green hydrogen into electricity, heat, and water without combustion, cutting up to 2,900 tonnes of CO2 annually and showcasing hydrogen's role in decarbonizing hard-to-abate sectors such as construction.
- / **Hive Hydrogen:** Issued RfPs to 15 shortlisted EPC firms for its \$5.8 billion Coega Green Ammonia Project in Nelson Mandela Bay, Eastern Cape. The project will integrate a 1,430 MW solar PV and 1,879 MW wind cluster to power facilities producing over one million tonnes of green ammonia annually for export to Asia and Europe by 2029-2030.
- / **Hynfra & Mauritania:** Signed \$1.5 billion framework agreement for 100,000 t/year green ammonia plant



near Nouakchott, targeting 2030 exports.

- / **KIT & H2Mare Consortium:** Opened world's first offshore PtX pilot plant to produce synthetic fuels from wind energy, seawater and air on a floating platform.
- / Moeve & Zaffra (Sasol-Topsoe JV): Signed an MoU to jointly assess the development of e-SAF production facilities in southern Spain, integrating Moeve's Andalusian Green Hydrogen Valley project to supply renewable hydrogen for synthetic aviation fuel.
- / MOL Group: Bratislava Refinery successfully tested diesel fuel with SAF and HVO compatibility.
- / ORLEN: Began offering SAF at Warsaw, Kraków, and Katowice airports in Poland.
- / Paragon Resources & Siemens: Signed an MoU to scale Paragon's ultra-clean hydrogen production process, which generates hydrogen by reacting recycled aluminium with water in the presence of a catalyst, eliminating the need for fossil fuels, external electricity, or carbon capture.
- / Powerhouse Energy & B.S. Holdings: Signed a Letter of Intent making Powerhouse the exclusive supplier of 99.999% pure hydrogen for the planned Fuel Cell (Penta) H2P project in Ballymena, Northern Ireland, which will use hydrogen-to-power technology developed by B.S. Holdings.
- / Rolls-Royce Power Systems & Ineratec: Partnered to supply green hydrogen-based e-diesel for backup generators at data centres in Germany.
- / **Vinci:** Awarded \$1.4 billion contract for biofuel plant in Spain producing 500,000 t/year of SAF and HVO100 from waste and used cooking oil.

Americas

- / Amogy & KBR: Signed MoU to advance ammonia-to-hydrogen technologies, integrating Amogy's ruthenium-based ammonia-cracking catalysts into KBR's hydrogen production platforms for potential commercial deployment across industrial and offshore applications.
- ArcelorMittal & Utility Global: Entered the FEED stage for a pilot project at ArcelorMittal's Juiz de Fora steel plant in Brazil to produce hydrogen from blast-furnace off-gases using Utility Global's patented H2Gen solid-oxide reactor, which splits water without external electricity by utilising the chemical energy of CO and CO2 gases to generate hydrogen and a pure CO2 stream for capture.
- / **Chevron:** Plans to develop the \$5 billion Project Labrador blue hydrogen and ammonia facility in Port Arthur, Texas, producing lower-carbon hydrogen and ammonia via steam-methane reforming with carbon capture.
- / **CPS Energy & Modern Hydrogen:** Partnered to pilot distributed methane pyrolysis technology in Texas that converts natural gas into clean hydrogen and solid carbon for reuse in asphalt.
- / National Grid Ventures: Installing the world's first commercially deployed 100% hydrogen-fuelled linear



generator at Northport Power Plant, New York, in partnership with NYSERDA and LIPA.

- / **Nikkiso CE&IG & WestAir:** Partnered to develop a hybrid hydrogen trailer and refuelling station in California, combining hydrogen transport and distribution technology.
- / **NuScale Power & GSE Solutions:** Launched world's first integrated hydrogen production simulator within a Small Modular Reactor control room environment, designed to support production of 200 t hydrogen.
- Verne: Secured \$4.5 m state-backed funding to build its first cryo-compressed hydrogen technology manufacturing facility in Pennsylvania.

Asia & Oceania

- ACME Cleantech Solutions: Won India's first-ever green ammonia auction under SECI's SIGHT Scheme, securing a 10-year contract to supply 75,000 t/year to Paradeep Phosphates in Odisha at ₹55.75/kg (\$0.64/kg), marking a landmark price discovery close to grey ammonia costs.
- / Amogy & A*Star: Signed MoU to co-develop ammonia-to-power technologies and pilot hydrogen projects on Jurong Island, Singapore, using imported low-carbon ammonia.
- / **Bintulu Port & Guofuhee:** Signed MoUs to develop a liquid hydrogen facility, positioning Bintulu as a hub for hydrogen logistics and exports in Southeast Asia.
- / China Energy Investment Corporation (CEIC): Received approval to build 2.2 GW green hydrogen-to-ammonia project in Inner Mongolia, aiming to produce 1.35m t/year ammonia with 442,000 Nm3/h electrolyzer capacity.
- / Energys: Secured planning approval for Victoria's first commercial B2B green hydrogen facility in Hastings, featuring a 1 MW PEM electrolyzer operated by Coregas to displace grey hydrogen in industrial, transport and stationary energy sectors, supported by Australia's Renewable Hydrogen Commercialisation Pathways Fund.
- / **FuelCell Energy & CGN:** Signed a 10 MW repowering agreement in South Korea, under which FuelCell Energy will supply eight carbonate fuel cell modules and provide seven years of O&M services for CGN-Yulchon's Gwangyang facility.
- / HAMR Energy & thyssenkrupp Uhde: Completed the Pre-FEED phase for the Portland Renewable Fuels Project in Victoria, which will convert biomass residues and renewable electricity into green methanol for shipping and aviation use.
- / **HIF Global:** Relocated its planned \$2 billion green hydrogen-based methanol plant in Tasmania from Hampshire to the former Burnie paper mill to leverage deep-water port access and modular construction advantages. The 255 MW e-fuels project will produce methanol synthesized from green hydrogen and captured CO2 for use as a sustainable fuel.



- Jakson Green & Coromandel International: Won SECI auction to supply 85,000 t/year green ammonia at record-low ₹50.75/kg (\$0.58/kg), setting new price benchmark in India.
- Jilin Electric Power: Completed preparation of its RMB 5.96 billion (\$822 million) green hydrogen and ammonia complex in Da'an, Jilin Province, integrating 700 MW wind, 100 MW solar and 40 MW/80 MWh storage. The plant targets annual output of 32,000 t green hydrogen and 180,000 t green ammonia and features mixed PEM and alkaline electrolysis and solid-state hydrogen storage supplied by LONGi, Sunshine, Sany and Perri Hydrogen Energy.
- / **KP Group, AHES & GH2 Solar:** Formed JV to build 100,000 t/year green ammonia plant in India, operated by KPI GH with South Korean and Indian partners providing technical and strategic support.
- / **LONGi Green Energy:** Began construction of a RMB 2.365 billion (\$325 million) biomass—green hydrogen methanol project in Inner Mongolia combining 600,000 t/year agricultural waste gasification with hydrogen from 100 5 MW electrolyzers, producing 400,000 t/year green methanol and cutting 1.2 Mt CO₂ annually.
- / Mingyang Hydrogen: Shipped the 30 MW Jupiter-1, the world's largest pure hydrogen gas turbine, from its plant in China to Otog Banner, Ordos, Inner Mongolia, for integration into a hydrogen-based energy storage demonstration project featuring a 48,000 Nm3/h hydrogen plant, 150,000 t/year green ammonia facility, 500 MW wind farm, and twelve 1,875 m3 storage tanks.
- / **Mitsui E&S:** Converted a diesel-powered rubber-tired gantry crane at Yokohama's Minami-Honmoku Terminal to a hydrogen fuel cell system for Japan's first live port trial under the Carbon Neutral Port initiative.
- / NTPC Renewable Energy: Won India's second green ammonia auction under the SIGHT Scheme with a record-low bid of ₹51.80/kg (\$0.59/kg), securing a 10-year contract to supply 70,000 t/year of green ammonia to Krishana Phoschem in Madhya Pradesh.
- / Onix Renewable: Won the fifth SECI green ammonia tender in India with a 10-year contract to supply 50,000 t/year to Gujarat Narmada Valley Fertilisers & Chemicals at ₹52.50/kg (\$0.60/kg).
- Oriana Power: Secured its third SECI award under India's SIGHT Scheme with a 10-year contract to supply 60,000 t/year of green ammonia at ₹52.25/kg (\$0.59/kg) to Madhya Bharat Agro Products in Madhya Pradesh.
- / SCC Infrastructure & InSolare Energy: Won SECI's fourth green ammonia auction under India's SIGHT Scheme with a 10-year contract to supply 70,000 t/year of green ammonia to Madhya Bharat Agro Products in Maharashtra at ₹53.05/kg (\$0.60/kg).
- / **SOHAR Port & Freezone & HYNAT SA:** Signed an MoU to develop an integrated natural hydrogen value chain in Oman, covering exploration, production, storage and logistics infrastructure, alongside demand assessment and export potential.
- Técnicas Reunidas & Sinopec: Secured a FEED contract from ACWA Power for a 4 GW green hydrogen-to-ammonia complex in Yanbu, Saudi Arabia, designed to produce 400,000 t of green hydrogen per year for conversion into ammonia, supported by desalination and export facilities, with commissioning targeted for



2030.

- / Uzbekistan & Allied Green Ammonia: Plan to advance a large-scale industrial project in Khorezm focused on producing SAF from green ammonia, following a framework agreement signed in August 2025.
- Woodside, Japan Suiso Energy & KEPCO: Signed an MoU to develop a liquid hydrogen supply chain between Australia and Japan. The plan involves producing hydrogen at Woodside's proposed H2Perth project and exporting it via dedicated carriers to Japan, with net-zero operations targeted through carbon capture and offsets.



Funding & M&A

Europe & Africa

- / Air Liquide: Announced an investment of over 250 million euros to build three air separation units and two hydrogen production units in Dresden, Germany, under a long-term contract to supply ultra-pure gases to the semiconductor industry.
- / **Brineworks:** Raised €6.8 million (\$8 million) to commercialize an electrolyzer system that co-produces hydrogen and captures CO₂ via direct air capture. The package includes a €1.8 million (\$2.1 million) EIC Accelerator grant and €5 million (\$5.83 million) in equity led by SeaX Ventures with multiple climate-tech investors.
- / CIP & H2APEX: Copenhagen Infrastructure Partners acquired a 70% stake in the first phase of H2APEX's IPCEI-backed hydrogen project in Lubmin, Germany, through its Energy Transition Fund, investing €15 million (\$17.5 million) ahead of FID to support a planned 100 MW facility producing up to 10,000 tonnes of hydrogen annually by 2028.
- / **EIB & Snam:** Approved a €264 million (\$307.7 million) loan to integrate biomethane production plants into Italy's national gas network.
- / Enova: Awarded NOK 763 million (\$75.5 million) to six Norwegian projects developing hydrogen- and ammonia-powered vessels to accelerate zero-emission shipping. LH2 Shipping and Møre Sjø will build four hydrogen-fueled bulk carriers, while Amon Maritime will construct two large ammonia-fueled bulk carriers for delivery by 2029. The funding also includes plans for Norway's first ammonia bunkering infrastructure along the coast.
- / **Essent:** Secured over €30 million (\$35 million) in government funding to advance two green hydrogen projects in the Netherlands, the 2.5 MW GROHW electrolyzer in Deventer and the 20 MW HyDeer plant in Flevoland, both targeting RFNBO certification.
- GreenH: Aims to start hydrogen production in Hammerfest by 2029 after securing NOK 256 million (\$22 million) in EU funding, signing a letter of intent with the municipality and initiating talks with the local power company.
- / **HyCC:** Received a Dutch OWE grant for its 90 MW H2eron green hydrogen project in Delfzijl, which will produce renewable hydrogen from water and electricity to decarbonize local industries in the Netherlands, Belgium, and Germany.
- / **John Cockerill & McPhy:** Completed the acquisition of McPhy Energy for €600,000 (\$699393), securing its Belfort gigafactory and 70% of jobs. The deal preserves €50.5 million (\$58.7 million) in EU subsidies and launches the new "MoJo-stack" electrolyzer line to strengthen John Cockerill's European hydrogen manufacturing base.
- / Khimod: Raised €23 million (\$27 million) to accelerate the industrialization of low-carbon hydrogen Power-to-X technologies and project deployment.



- / Lhyfe: Raised €2.5 million (\$2.9 million) from 1,200 investors to fund four hydrogen sites in France and Germany.
- / Linde: Received €4.3 million (\$4.7 million) in funding for a 5 MW alkaline electrolysis plant in Leuna, Saxony-Anhalt. The facility, scheduled for commissioning by the end of 2026, will produce 450 tonnes of green hydrogen annually, complementing Linde's existing 24 MW plant.
- / Provaris Energy: Raised \$1.08 million to expand hydrogen and CO2 storage technology solutions in Europe.
- / Repsol & Enagás Renovable: Are investing more than €300 million (\$348.7 million) in a 100 MW electrolyzer in Cartagena, Spain. Recognised as an IPCEI project with €155 million (\$180.2 million) in public aid, the plant will produce 15,000 tonnes of renewable hydrogen annually, cut 167,000 tonnes of CO2, create about 900 jobs and start operations in 2029.
- / **RWE:** Was awarded over €500 million (\$581.2 million) by RVO to build a 100 MW offshore wind-powered green hydrogen plant in the Netherlands.
- / **Snowfox:** Raised \$30 million in a Series A round led by bp Ventures and Rio Tinto to scale natural hydrogen exploration technologies and projects.
- Stargate Hydrogen: Secured €11 million (\$12.8 million) in Series A investment led by Repsol and inaugurated a new manufacturing facility to scale hydrogen technology production.
- / Stargate Hydrogen & Repsol: Entered a partnership in which Repsol's Corporate Venture arm acquired a minority stake in the Estonian electrolyzer manufacturer to accelerate its expansion and R&D for next-generation alkaline electrolyzers. The collaboration will expand production capacity from 140 MW to more than 1 GW annually and support joint initiatives across Europe, the Middle East and Asia.
- / **Thyssenkrupp Nucera:** Completed the acquisition of key technology assets from Danish manufacturer Green Hydrogen Systems, including IP and a full-scale test facility in Skive, Denmark.
- / TNO & HyCarb Project: Were awarded more than €45 million (\$52.3 million) in research and innovation funding to develop hydrogen-based chemical processes to decarbonize the Dutch chemicals sector.

Americas

- / **Aemetis:** Signed \$30 million contract for energy efficiency upgrade at Keyes Ethanol Facility, supported by \$19.7 million in IRS, California Energy Commission and PG&E incentives.
- **Atome:** Secured \$50 million financing from the Green Climate Fund to advance its large-scale green fertilizer project in Paraguay.
- / **Elemental Trucks:** Received \$1.5 million from Natural Resources Canada to develop North America's first 63.5-tonne commercial zero-emission hydrogen truck.



- / **Energy Vault:** Secured a \$50 million corporate debenture financing facility from YA II PN Ltd. to strengthen working capital and support the company's global energy storage growth projects, including battery, gravity and green hydrogen technologies across the U.S., Europe and Australia.
- / **HydrogenXT:** Secured a definitive \$900 million term sheet to build the first ten zero-carbon hydrogen production and dispensing plants across North America.
- / Independence Hydrogen & Sumitomo: Sumitomo Corporation of Americas made a strategic investment in Independence Hydrogen to expand decentralized hydrogen production and distribution projects across the United States
- NEXTCHEM (MAIRE): Awarded a €210 million (\$244.8 million) contract for basic engineering and proprietary equipment supply for the \$3.3 billion Pacifico Mexinol project in Sinaloa, Mexico, which will use green hydrogen and captured CO2 to produce up to 2.1 million tonnes per year of ultra-low-carbon methanol based on NEXTCHEM's NX AdWinMethanol Zero technology, with operations expected to start in 2029.
- / **Plug Power:** Awarded \$2 million state grant to design hydrogen distribution trailers using cryo-compression technology for more efficient hydrogen storage and transport.
- / **Tango Solar Norte:** Received final environmental approval from Mexico's Ministry of Environment and Natural Resources for a \$1.17 billion, 921 MW solar-to-hydrogen project in Sinaloa, designed to produce 41,485 tonnes of green hydrogen annually over a 40-year operational period.

Asia & Oceania

- / **Equatic:** Raised \$11.6 million in Series A funding led by Temasek Trust to advance carbon removal and green hydrogen production technologies.
- Japan Suiso Energy (JSE): Secured investment from six Japanese firms including Ebara, Obayashi, Tokyo Century, Development Bank of Japan, Mizuho Bank and Mitsubishi Chemical Industries to expand its liquefied hydrogen supply chain initiative led by Kawasaki Heavy Industries and Iwatani.
- / **JKSH & Hynfra:** Announced an investment of approximately \$4.2 billion in Machilipatnam, India, to develop projects producing 150,000 tonnes of green hydrogen and 600,000 tonnes of green ammonia annually, creating over 10,500 jobs.
- / **Provaris Energy:** Raised \$1.08 million through a share placement to accelerate development of its hydrogen and CO2 storage and marine transport technologies in Europe, including its proprietary hydrogen tank program in Norway and the commercialisation of its H2Neo carrier and H2Leo barge in partnership with Japan's K Line.
- **PuriFire Energy:** Raised \$3.5 million in seed funding led by HICO Investment Group with participation from Bulnes Capital, R&R Investments and Abhishek Desai, to accelerate hydrogen technologies.
- **Toyota, Mitsubishi Gas Chemical & Eneos:** Acquired a combined 22% stake in Australia's Gold Hydrogen for \$9.5 million, supporting natural hydrogen exploration in South Australia.

FOR MORE INFORMATION:

delphidata.com

WHO WE ARE

Delphi Data Labs was founded in 2020 by a team of industry experts with a passion for driving the adoption of hydrogen as a clean and renewable energy source. Our mission is to help organizations navigate the rapidly evolving hydrogen market and make informed decisions about their investment and growth strategies.

