Green Hydrogen Production (electrolysers)

Source Metadata

Field	Value
source	iea
source_version	ETCS 2025
source_id	IEA-CRS-002
iea_category	cross_cutting
technology	Green Hydrogen Production (electrolysers)
technology_readiness	early_commercial
mitigation	Y
adaptation	N
last_checked	2026-05-26

IEA Technology Definition

The IEA classifies electrolysers as a key clean energy technology for producing green hydrogen by splitting water using renewable electricity. The ETP Technology Guide identifies electrolysers alongside solar PV, wind, batteries, EVs, and heat pumps as the six pillar technologies of the clean energy transition. Electrolyser types include alkaline (most mature), proton exchange membrane (PEM), and solid oxide (SOEC, at demonstration stage).

Technology Readiness & Deployment

Green hydrogen is at early commercial stage. Global investment in low-emissions hydrogen production climbed to nearly USD 8 billion in 2025, with year-on-year growth of 80%. Electrolyser deployment growth to 2030 is comparable to solar PV's early ramp-up trajectory. A record number of technologies advanced in technology readiness level across the hydrogen value chain during 2024-2025. However, actual deployed electrolyser capacity remains a fraction of announced project pipelines, and the IEA flags the need for faster final investment decisions.

Key Metrics & Benchmarks

Alkaline electrolyser costs range from USD 500-1,400/kW, while PEM systems cost USD 1,000-2,000/kW. Green hydrogen production costs range from USD 3-8/kg depending on electricity costs and utilization rates. The IEA projects costs could fall to USD 1.5-3/kg by 2030 in regions with excellent renewable resources. Global electrolyser manufacturing capacity is expanding rapidly, with China dominating production.

LATAM Relevance

Latin America is positioned as a potential green hydrogen export hub due to abundant low-cost renewable resources. Chile's National Green Hydrogen Strategy targets becoming a top-three exporter by 2040. Colombia, Brazil, and Uruguay have also launched hydrogen strategies. The Atacama region's solar resources and Patagonia's wind resources offer some of the world's lowest-cost renewable electricity, potentially enabling competitive green hydrogen production below USD 2/kg.

Critical Minerals Link

PEM electrolysers require iridium and platinum catalysts, creating supply chain risks given concentrated production in South Africa and Russia. Alkaline electrolysers use nickel electrodes. SOEC systems require rare earth elements. Electrolyser stacks also use titanium, zirconium, and specialty steels. Reducing platinum group metal loading is a key research priority.

Cleantech Taxonomy Crosswalk

Maps to Cleantech Taxonomy sectors: ES (Energy Systems) — hydrogen production, power-to-gas; IN (Industry) — electrolyser manufacturing, industrial hydrogen supply; TR (Transport) — hydrogen for fuel cells; XS (Cross-Sectoral) — sector coupling, energy storage via hydrogen.

Revisión #2
Creado 2026-05-27 03:38:39 UTC por Gideon Blaauw
Actualizado 2026-05-27 03:49:52 UTC por Gideon Blaauw