

Green Hydrogen Will Become The 21st Century Version Of Oil

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Hydrogen energy storage gas tank for clean electricity solar and wind turbine facility.3d rendering GETTY

When green hydrogen gets its legs, it will become the ‘new oil’—the energy source that drives the global economy. As such, countries are now preparing and forming international coalitions to position themselves for that future.

The quest to hit net zero by 2050 is generating interest in clean hydrogen, which also has the potential to decarbonize hard-to-

abate sectors such as steel, chemicals, and shipping. While technology and clean energy prices are falling, they must decline more to complete this energy transformation.

"We need to reduce emissions and provide clean energy, which will require new investments in the technology and production of green hydrogen," says Fredrik Mowill, chief executive of [Hystar](#), in an interview. "If you need clean energy, then green hydrogen is an important part of that transition. The money flowing in will create new jobs, technologies, and markets, tremendously impacting the entire value chain. We will spend less money on traditional carbon-based fuels, too."

The green hydrogen market will expand from about \$1 billion today to \$30 billion in 2030, according to [MarketsandMarkets](#). Low renewable energy prices and advancements in electrolysis will drive the growth. However, a lack of transportation and storage infrastructure is a barrier. That's why countries and companies are partnering to build economies of scale.

The advantages of hydrogen are that it is abundant, renewable, and non-polluting. But it is expensive to make, transport, and store.

Today, coal and natural gas reactions produce almost all hydrogen, referred to as "grey hydrogen," and do nothing to limit CO₂ emissions. The goal is to create hydrogen from low-carbon sources, or "green hydrogen."

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For example, the United Arab Emirates targets a 25% global market share of low-carbon hydrogen by 2030. It is joining forces with Germany to expand its portfolio. Furthermore, Japan announced a \$100 million investment to convert fossil-fired plants into ammonia and hydrogen-based plants. South Korea, meanwhile, has set aside \$40 billion to expand its hydrogen infrastructure by 2040—from production tools to fuel cells to filling stations.

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"As a result of this energy transition and increased investment in green hydrogen, we are seeing international consortiums in the United States, Australia, and the Middle East," says Mowill. "The challenge is to scale up and meet the demand."

Scale Is The Goal

Consider: Solar panels may create excess power—energy stored in a battery and used in an electrolyzer to make pure hydrogen and produce electricity. The electrolyzer creates an electric current to split the hydrogen and oxygen from water.

To that end, the Norwegian energy conglomerate Equinor is working with Hystar to test electrolyzers associated with offshore wind power. Plug Power PLUG -4.3%, and Fortescue Future Industries

are partnering to build a gigafactory in Queensland, Australia, to produce those devices. European and Asian companies are deploying Enapter's electrolyzer. [Hydrogen Insights 2023](#) says manufacturers had \$8 billion of electrolyzers in the queue through October 2023.

Cost is the obstacle. Scale is the goal. Steel and shipping are among the most complex sectors in which to decarbonize. Enter green ammonia, an interim step for industrial users—a fuel that wind and solar power can produce and that traditional engines or fuel cells can use. Traditionally, industries burn gas to boil water to make steam or coal to heat a boiler, which uses a lot of fuel and creates too many emissions.

[DNV GL](#) predicts widespread adoption of ammonia fuel will begin in 2037 — expected to make up 25% of the maritime fuel mix by 2050; [shipping](#) comprises 13% of all transportation-related CO₂ releases. Samsung Heavy Industries, Lloyd's Register, and MAN Energy Solutions are developing an [ammonia-fuel ship](#).

Steel is also hard to decarbonize—a \$1 trillion industry contributing about 7% of global greenhouse gas emissions. Germany's [Uniper](#) focuses on producing hydrogen from green sources, while Salzgitter is a vast steel maker that wants to produce steel using green hydrogen. In this case, Uniper is developing green hydrogen projects to convert green ammonia back to hydrogen.

DNV GL says, "Green hydrogen from electrolysis will be the main long-term solution for decarbonizing hard-to-abate sectors."

Suppose green hydrogen hits its potential: Manufacturers could reduce their production costs and emissions—a win-win in a competitive global economy. That's the force behind many



international partnerships and why green hydrogen may likely become this century's energy king.

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