



GOLD HYDROGEN

**"I BELIEVE THAT WATER WILL ONE DAY BE USED AS A FUEL, THAT HYDROGEN AND OXYGEN, WHICH CONSTITUTE IT... WILL PROVIDE AN INEXHAUSTIBLE SOURCE OF HEAT AND LIGHT."
JULES VERNE'S 1874 NOVEL THE MYSTERIOUS ISLAND.**

In the town of Bourakébougou in Mali, West Africa, workers drilling a water well noticed an unusual breeze coming from the hole. When one of the workers lit a cigarette, the gas exploded, setting off a fire that burned for several days. The breeze turned out to be highly combustible hydrogen. By day, the flames looked like 'blue sparkling water'. At night, the flames glowed like 'shining gold'.

Beneath Bourakébougou is a field of natural hydrogen that spans over 8 square kilometres, which is constantly being replenished by geochemical processes within the Earth. For over a decade, this naturally renewable source of hydrogen has been burned to produce cheap and clean electricity for the 4,000 town inhabitants.

Hydrogen is a colourless and odourless gas, with an energy density nearly three times that of fossil fuels. When burned to generate electricity, it combines with oxygen in the air to form water as its only emission. A non-greenhouse gas that is naturally renewable, underground hydrogen should be the perfect source of clean energy.

While hydrogen is the most abundant element on Earth, it is also one of the most reactive—it combines readily with carbon to produce hydrocarbons i.e. fossil fuels. Nearly all of the hydrogen used today is cheaply produced using coal or natural gas (methane). This 'grey' hydrogen generates more carbon emissions than the global aviation industry. With 'blue' hydrogen, the pollution is captured and stored underground, but this is not currently being done on a large scale.

Most hydrogen on Earth is bonded to oxygen in the form of water (H₂O). Breaking these bonds through electrolysis using renewable energy sources, such as solar or wind, to produce 'green' hydrogen, is good for the Earth but expensive, costing over three times as much as blue hydrogen. Consequently, green hydrogen makes up just 1% of the global total annual hydrogen production.

Falling renewable energy costs, economies of scale and technological advances led to feverish investor expectations that green hydrogen would narrow the price gap. But prices remain stubbornly high, causing a crisis of confidence in the sector's near-term viability, resulting in many green hydrogen projects being shelved. After a surge in green energy stock prices in late 2020 through early 2021, the hydrogen economy is now having its dotcom moment, with one leading hydrogen stock index down -55% over the last five years.

The hydrogen hype cycle may have cooled, but it retains a critical role in a sustainable future. For instance, oil production in the North Sea is set to decrease to less than 20% of current levels by 2050. To compensate, countries along the North Sea coast plan to scale up offshore wind power from under 30 GW today to 300 GW (roughly equivalent to that of 300 large nuclear power plants) by 2050. Covering 9% of the North Sea, these vast wind farms could power electrolysis plants capable of churning out green hydrogen on a massive scale – enough to supply 10% of EU's energy needs.

The discovery of underground hydrogen in Mali may also mark a turning point and one for the history books, alongside the discovery of the first oil field in Titusville, Pennsylvania. Up until 1859, the world had been blind to the vast deposits of oil that lay underground, when an almost bankrupt prospector in Titusville that year struck black gold. The discovery launched an oil rush, marking the beginning of the modern petroleum age, which transformed the global economy and environment.

Experts long believed there was little to no hydrogen stored in the Earth. The discovery in Mali suggests that beneath our feet lie

unnoticed, untapped, underground reservoirs of naturally occurring hydrogen. Could these natural reserves of what is being called 'gold' hydrogen become the 21st century's equivalent of the oilfields of the Persian Gulf, Western Siberia and Venezuela's Orinoco Belt?

In 2023, the largest known deposit of natural hydrogen was discovered in the Moselle region of northern France. More reserves are thought to exist elsewhere in Europe, Australia, the Middle East, the US, Canada, Brazil, Russia and the Philippines. Many reserves will be economically inaccessible, but,

IF JUST 2% OF UNDERGROUND HYDROGEN IS RECOVERABLE, IT COULD MEET PROJECTED DEMAND FOR CENTURIES, EXCEEDING THE ENERGY VALUE OF ALL KNOWN NATURAL GAS RESERVES.

It all sounds promising. But it is almost completely unproven, so far. No commercially exploitable reserves have been confirmed at scale. Currently, underground hydrogen supplies the world with less energy than a single wind turbine.

Investor interest is growing, despite the clouds over hydrogen's future, with venture capital and private equity having committed \$10 billion to hydrogen-related companies since 2021. \$1 billion has gone into the hunt for gold hydrogen, having funded around 200 exploration wells worldwide – mostly out of public view – with more than 60 companies racing to strike it rich. These companies resemble lottery ticket investments, with a high likelihood of complete loss, but offering a slim chance of an outsized payoff. Still, hydrogen's promise is attracting some of the world's most influential investors. Through venture capital funds, its backers include Bill Gates, Amazon's Jeff Bezos, Virgin Group's Richard Branson, Alibaba's Jack Ma, and Ray Dalio, one of the world's most successful hedge fund managers.

**IN THE EXPLORATION FOR
GOLD HYDROGEN RICHES,
BILL GATES SHARED HIS
EXCITEMENT WITH THE
ECONOMIST: "IT COULD BE
GIGANTIC OR IT COULD BE A
BUST, BUT IF IT'S REALLY
THERE... WOW!"**

ALL INVESTMENTS INVOLVE THE RISK THAT YOU MAY NOT GET BACK ALL THE MONEY YOU INVESTED.

THE VALUE OF AN INVESTMENT CAN CHANGE QUICKLY AND MAY GO DOWN AS WELL AS UP.

PAST PERFORMANCE IS NOT A RELIABLE INDICATOR OF FUTURE RETURNS.

INVESTORS SHOULD BUILD A DIVERSIFIED PORTFOLIO TO SPREAD RISK.

Asia Pacific Investment Advisors Ltd
6/F Wings Building, 110-116 Queen's Road, Central, Hong Kong SAR
Registered Address: 801 & 803, Won Hing Building, 74-78 Stanley Street, Central, Hong Kong SAR
Tel: +852 9189-9633; email: sean.c@apg-hk.com
website: www.apiahk.com

Registered with the Hong Kong Securities and Futures Commission (AAG391)
Insurance Authority Licensed Insurance Broker (FB1449)