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EXTRACTING THE HYDROGEN FOUND NATURALLY IN THE EARTH



AGRICULTURE & ENERGY

One company plans to extract rather than produce hydrogen, revolutionising its potential as an alternative for fossil fuels

Spotted: Hydrogen is a promising fuel for a future decarbonised economy, but, currently, **more than 99 per cent** of the hydrogen produced globally comes from fossil fuels. Green hydrogen, which is produced by running a renewable electric current through water, is a leading alternative to fossil-derived hydrogen, but it comes with its own set of challenges, such as the high cost and energy demand of the electrolyzers used to produce it. This has led innovators to look for further clean sources of hydrogen to supplement the nascent green hydrogen industry.

This is where US startup Koloma comes in. The company aims to extract naturally occurring hydrogen from iron-rich rocks, taking advantage of a natural process called serpentinization. During this process, groundwater reacts with iron in the Earth's crust to create pure hydrogen in a reaction that goes on continuously, replenishing the gas at a rate of 23 megatonnes per year – which is equivalent to around 30 per cent of the world's hydrogen demand.

Once geologic hydrogen is formed, there are several natural mechanisms by which it can become trapped to form reservoirs that can be tapped through drilling wells. Koloma is currently exploring its first test wells in the American Midwest (their precise locations are kept secret), which is yielding samples that are being analysed for volume and purity. The company's founder, Dr. Tom Darrah, a professor of earth sciences at Ohio State University, has secured multiple patents for hydrogen extraction technologies.

The hydrogen Koloma hopes to extract promises several benefits over hydrogen produced using existing methods. According to data shared by the company, the carbon intensity of geologic hydrogen is only marginally greater than green hydrogen produced using renewable energy – the current gold standard for clean hydrogen. However, it also requires almost no external water and

nal energy as inputs, which sets it apart from all other hydrogen production methods, hydrogen. It also does not rely on large-scale wind turbines or solar farms, which take up a significant amount of land.

The promise of geologic hydrogen has captured the attention of several startups, but Koloma has just received \$91 million of funding from the Bill Gates Foundation, meaning it is well-placed to expand its capabilities and the production of geologic hydrogen a commercial reality.

Springwise has covered several alternative sources of clean hydrogen including [a company that is producing Green Hydrogen from biowaste](#) and [a process for making hydrogen and carbon black without combustion](#).

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Takeaway:

Geologic hydrogen remains in its infancy, but it could have huge potential. A [model](#) presented at a 2022 meeting of the Geological Society of America suggests that there may be enough natural hydrogen to meet rising global demand for thousands of years. The race is therefore on to find sites and technologies to scale-up production, and Koloma is at the head of this race. Reliance on extracting the gas from the earth may raise some alarm bells, but unlike fossil fuels that take millions of years to form, hydrogen is continually being naturally generated in the earth's crust. For this reason, geologic hydrogen's proponents argue that is not only clean but a renewable resource.