

White Hydrogen

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Image Courtesy Hydrogen Fuel News

Having posted 2 articles on Green Hydrogen and its potential as a clean fuel in the past 5 months I was very excited to see the article in the New York Times on December 4 entitled: [*It Could be a Vast Source of Clean Energy Buried Deep Underground*](#). The article was about scientists digging in Lorraine - a former coal mining region near the French-German border - and finding White Hydrogen.

But my first reaction was: what is White Hydrogen? In my July 2023 article entitled: [*The Greening of Hydrogen; Can it be a Major Contributor to the Energy Transition?*](#) I outlined the different “colors” of hydrogen that I knew about: Green; Blue; Grey; Pink; Yellow; and Turquoise – each of which is produced differently. But not White Hydrogen.

Turns out that there has been a lot less written about White Hydrogen, sometimes known as Natural Hydrogen¹, which is hydrogen gas that is naturally generated within the Earth’s crust. The process involves interactions between water molecules and iron-rich minerals at high temperatures and pressures. This is distinct from other hydrogen production methods that have typically relied on fossil fuels (Grey Hydrogen and more) or Green Hydrogen which is created from the electrolysis of water using renewable energy sources. But the lack of focus on White Hydrogen is beginning to change.

¹ Also sometimes referred to as geologic, native, or golden hydrogen.

White Hydrogen was first discovered in the village of Bourakébougou, Mali in 1987. Diggers that were trying to drill for water noticed that the hole was emitting 'wind'. The 'wind' then had accidental contact with a lit cigarette and ignited into a bright, continuous flame – which led investigators to identify the presence of hydrogen gas.

At first it was thought that natural hydrogen was scarce, but recent discoveries have suggested that significant quantities of natural hydrogen may exist beneath the earth's surface. A July 2023 article in the British Telegraph entitled [Limitless White Hydrogen Under our Feet May Soon Shatter all Energy Assumptions](#) cited an April 2023 report by the US Geological Survey that there could be enough accessible hydrogen under our feet to meet our energy needs for hundreds of years. They also reported that the US DOE was drafting plans to help jumpstart the industry, deeming the potential "astronomical".

The NY Times article noted that White Hydrogen reserves have recently been detected in parts of the US, Australia, Africa, Russia, and Europe.

The article also pointed out that whether white hydrogen lives up to the hype remains to be seen. So far, the finds range from potentially huge ones that may take years to verify, like the one in Lorraine, to small or extremely deep accumulations that may not be economically viable to go after. And then there's the cost. Although the US and Europe have set aside billions to subsidize Green Hydrogen, none of that addresses White Hydrogen production. White Hydrogen's competitiveness depends on multiple factors, including the pressure the gas is under, the temperature, the type of rock that needs to be drilled, and more. But the potential appears to be enormous.

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