

23129 *Inside the Global Race to Turn Water Into Fuel*

Nytimes.com March 11th, 2023.

An Australian patch of desert, more than 100 miles from the nearest town, sits next to the biggest problem that green hydrogen could help solve: vast iron ore mines that are full of machines powered by immense amounts of dirty fossil fuels. Three of the world's four biggest ore miners operate dozens of mines here.

Green hydrogen is made by using renewable electricity to split water's molecules. (Currently most hydrogen is made by using natural gas, a fossil fuel.) The hydrogen is then burned to power vehicles or do other work. Because burning hydrogen emits only water vapor, green hydrogen avoids carbon dioxide emissions from beginning to end.

In Western Australia, and in dozens of spots around the globe endowed with abundant wind and sun, investors see an opportunity to generate renewable electricity so cheaply that using it to make green hydrogen becomes economical. Even if only some of the projects come to fruition, vast stretches of land would be duly transformed. The project is one example of a global gamble, worth hundreds of billions of dollars, being made by investors including some of the most polluting industries in the world.

Last year, government subsidies sped up action in the European Union, India, Australia, the United States and elsewhere. The United States aims to drive the domestic cost of green hydrogen down to a quarter of what it is now in less than a decade.

"We are about to jump from the starting blocks," said Anja-Isabel Dotzenrath, who once led Germany's biggest renewable energy company and now runs BP's gas and low-carbon operations. "I think hydrogen will grow even faster than wind and solar have."

Challenges loom on every level, from molecular to geopolitical.

Some energy experts say green hydrogen's business rationale is mostly hype. Doubters accuse its champions of self-interest or even self-delusion. Others see hydrogen as diverting crucial investment away from surer emissions-reduction technologies, presenting a threat to climate action.

Still, if the rosiest projections hold, green hydrogen in heavy industry could reduce global carbon emissions by 5 percent, if not two or three times that. In those scenarios, which are far from certain, hydrogen plays a crucial role in limiting global warming.

Fatih Birol, the Turkish economist who leads the International Energy Agency, said he seldom meets people who don't find green hydrogen alluring, with its elegant elementality. His organization forecasts that green hydrogen will fulfill 10 percent of global energy needs by 2050.