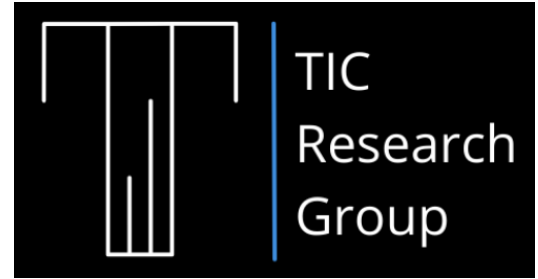


Tufts Investment Club - Research Group (“Trade Review”)
 Case Study - Fall 2022
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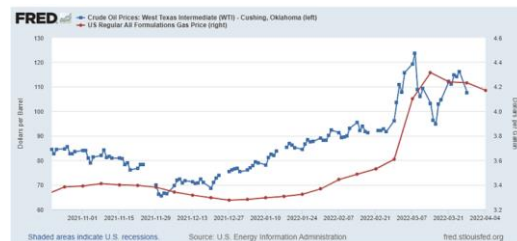
Sustainable is Attainable: Fossil Fuels and The Environment

It is clear that our current dependence on fossil fuels as a means of energy production is having devastating consequences on the environment and the global community. We are well aware that when we combust fossil fuels to generate energy, toxic byproducts including excess carbon dioxide are released into the atmosphere and contribute to destructive phenomena such as climate change and rising sea levels. Yet, despite our thorough understanding of these severely damaging effects, a 2020 report from the Environmental and Energy Study Institute indicated that fossil fuels continue to supply about 80% of the world’s energy (eesi). We must thus prioritize the research and development of alternative energy sources that do not leave our environment with a harmful carbon footprint in order to build toward a more sustainable future for us all.

Instability

The fossil fuel markets tend to have high volatility because they tend to fluctuate in correlation to the geopolitical situations of the countries that export them in high quantities. Not only are fossil fuels such as coal and oil harmful to the environment, but reliance on them also has the potential to spur the economic growth of many aspiring nations. At any point, crude oil prices can skyrocket if primary exporting countries endure challenges such as war or economic problems. The United States, for instance, receives a whopping 74% of its oil from just

Canada, Saudi Arabia, Mexico, Russia, and Colombia (eia.gov). As we have seen, Russia’s invasion of Ukraine took an immense toll on economies globally. The imposition of rigid sanctions and oil embargoes on Russia has left many nations, including the United States, with low oil supplies. These oil shortages prompted OPEC, an organization of thirteen oil-rich nations, to raise prices from 69.72 U.S. dollars per barrel in 2021 to 102.97 U.S. dollars per barrel this year (statista.com). The truth is, regardless of the geopolitical strife that exists, OPEC has the power to set high prices for oil. The thirteen oil-rich nations of OPEC, who supply 40% of the world’s oil, act as a price maker in the international oil market because of their vast market power (Weforum.org). Rather than pricing oil at a value that coincides with market equilibrium, OPEC leaders engage in extreme price gouging to enjoy high profit margins. Why should we rely on these unstable markets that can fluctuate at any moment only to obtain harmful energy inputs? The United States has been looking for ways to achieve energy independence in order to avoid these enduring economic burdens and fortify sustainability — hydrogen may be the answer.



Hydrogen Energy

Amidst the current rush to discover and mass produce dependable, effective green energy, one energy generation input that is being highly researched and tested is hydrogen. Hydrogen is one of the most abundant elements on the planet. When hydrogen undergoes nuclear fusion, a process by which hydrogen atoms combine to form an atom of helium, some mass is always converted to energy. Engineers have discovered ways to harness this energy in reactors and generate electricity with zero net carbon emissions. The Sun, our planet's energy source and inspiration for this green practice, undergoes constant hydrogen fusion reactions that allows life to sustain on Earth. Hydrogen can also produce electricity when it reacts with oxygen across an electrochemical cell to produce electricity, water, and small amounts of heat (eia.gov). The U.S. Department of Energy has found that hydrogen fuel cells are generally between 40% to 60% energy efficient. Considering the internal combustion engines we currently use for cars are only about 25% energy efficient, these findings are incredible (PlugPower.com). Living in a sustainable society may be attainable if we allocate our focus and investment expenditures to this sector of technology that mimics the natural processes of our Sun and produces emissions-free energy at incredible rates. With this novel industry on the brink of exponential growth, a world where humans and other animals do not have to be subjected to the turmoil of climate change may no longer be a utopian fantasy. Value of Hydrogen Hydrogen-derived energy is an industry that has been undergoing extensive research for about two decades. The initial public investing boom and the subsequent wave of research conducted was triggered in 2005 when the United States released its Energy Policy Act addressing the lucrative potential of the hydrogen economy. However, when the 2008 global financial crisis hit, the lack of available funding slowed developments as financial efforts

were redirected to more urgent problems. Nonetheless, with the investments initially made prior to 2008, steady technological development over the last decade has allowed the idea of hydrogen-based energy to return stronger than ever (Weforum). While the idea of entire countries or cities running solely on hydrogen power may have once seemed like a mere fantasy, the truth is that the hydrogen economy is becoming a reality.

Investing in Hydrogen

Despite its high volume in nature, most hydrogen is extracted using fossil fuels to create what is known as gray hydrogen. Green hydrogen, on the other hand, is made with renewably generated electricity used to separate water into hydrogen and oxygen. Most of the companies that extract green hydrogen and build fusion reactors or hydrogen cells remain closed from the public market and can therefore only receive private investments. However, there are a few companies that are public which makes the diversification offered by green hydrogen ETFs very attractive to investors. Several of the world's largest banks have confirmed that the hydrogen industry is estimated to grow immensely in the coming years with Goldman Sachs speculating a \$13 trillion market value for hydrogen by 2030 (Weforum). Specifically, a stock to keep an eye on is Plug Power which currently leads the hydrogen industry in terms of market cap with an \$8.04 billion dollar market cap. As a current leader in the hydrogen sector, Plug Power appears to have adequate resources to successfully grow its hydrogen energy products while increasing its stock value in the future. Given the promising future of hydrogen, the time to invest in companies that extract green hydrogen and develop cells is now.



We must look at purchasing hydrogen stocks as a growth investing strategy the investors seek to include in their portfolio as a long term opportunity based on structural change in energy markets. Rather than expecting large returns on investments within one or a few years, investors should understand that the growth projections are estimated to come to fruition over the next few decades.

Challenges

When any new technology enters a market, there is typically a period of stagnancy or negative growth for the companies selling it. This is a result of the high costs they must initially incur as they navigate ways to grow consumer appeal and develop more efficient models of their products. However, eventually, hydrogen energy companies will achieve economies of scale where the increase in their production will result in a proportionate saving in costs. According to Bloomberg, hydrogen could meet up to 24% of the world's energy needs by 2050 (iisd). The United States government appears eager to subsidize the hydrogen industry with hopes of making this form of energy cheaper and more readily available for everyone. For instance, the Clean Hydrogen Production

Tax Credit creates a new 10-year incentive for clean hydrogen production where projects can claim up to a 30% investment tax credit (energy.gov). The high demand of hydrogen, government tax incentives and subsidies, and the development of more efficient hydrogen reactor models will help drive down costs in the long run. Taking into consideration basic investing principles, we must also account for the expected time that this industry will take to boom. The excitement regarding the hydrogen industry should appeal especially to young investors looking with a longer time horizon and those who want to help our planet become cleaner and safer for future generations.

Final Thoughts:

A future devoid of fossil fuel use and filled with green hydrogen energy should excite us all. The time is now to help support this industry through investments so one day we will all win. Not only will investing in hydrogen be a profitable step toward cleansing our planet, but it will also be a key to achieving energy independence for the United States. The hydrogen economy has potential to provide more stable energy markets less prone to foreign geopolitical impact. Through investing in hydrogen, other nations can also make this essential move. Our goal, however, should not just be energy independence from the volatile fossil fuels markets and institutional price gougers. Indeed, the financial gains we can make as investors along with the environmental benefits should inspire us all to bolster the hydrogen sector as the cash king of the future

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Published by N. Sönnichsen, and Nov 15. “OPEC Crude Oil Price Statistics Annually 1960-2022.” Statista,
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