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GREEN HYDROGEN... END OF FOSSIL FUEL USE?

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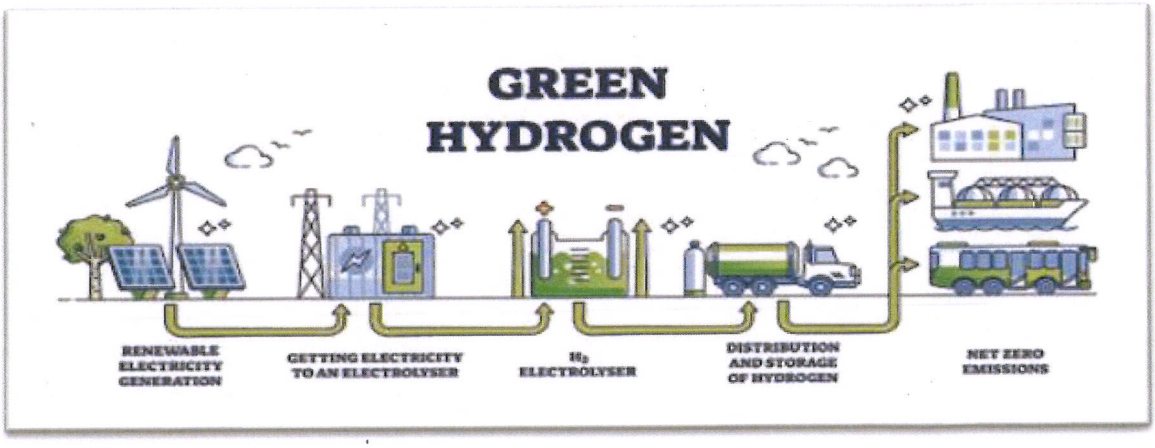
Introduction

Green hydrogen may or may not be our best implementation to reaching net 0 and reducing the overwhelming amount of greenhouse gases being emitted. It is also the most abundant chemical element in the universe and is about 73% of it! Which is why experts and scientists are so determined to experiment and try to reduce our large use of fossil fuel. Using this hydrogen, we could power all sorts of transportation systems industries without letting out any greenhouse gases or carbon dioxide be emitted. Green hydrogen and hydrogen in general play a significant role in our climate crisis. Though green hydrogen is 100% sustainable, there are still negative aspects. But the question is, will it still do the job?

The production of green hydrogen

Green hydrogen is unlike others and produces enough heat to competence huge industrial processes. While doing all this, it does not effuse any greenhouse gases. This is because green hydrogen is purely made from renewable energy sources, through the process of electrolysis splitting water into hydrogen and oxygen. Electrolysis is made from flow resources like wind or solar power, this eventually ends up splitting the water in an electrolyser, resulting in the separation of water and hydrogen. And all that has been produced is water vapor and heat, no greenhouse gases are being emitted. Plus, during the making of it the temperatures can rise to a scorching 2100 degrees Celsius, and power an abundance of everyday things like transportation, and industrial activity.



Different purposes of GH2

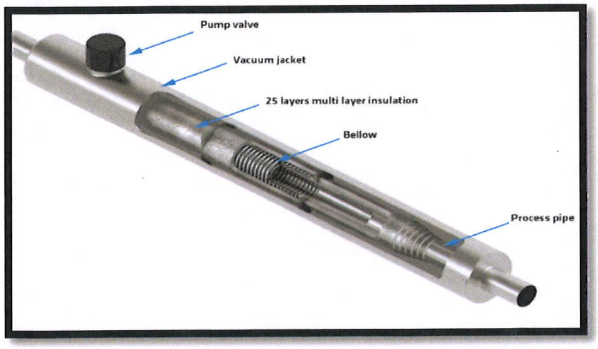
Hydrogen is a versatile gas and will help us power everyday things instead of fossil fuels which emit harmful greenhouse gases. But experts have figured that the process of producing it itself for industries is inefficient and expensive. Seeing that when we burn the newly made hydrogen, between

50 to 80 percent of clean electricity is lost during the process. Also considering that we would waste vast amounts of clean and natural power resources that will certainly be vital in the future. However, green hydrogen is and can be used in many other ways like hydrogen powered cars and heating systems. Countries like Germany, South Korea, and the U.S have already started to produce and use hydrogen powered vehicles. 52% of U. K carbon dioxide emissions in transportation are made from domestic vehicles. So just imagine the impact when they fuel cars with hydrogen instead! As you can see hydrogen is going to help us reach net 0 but to get this impact going around worldwide, we need to find a way to transport it.

Transportation

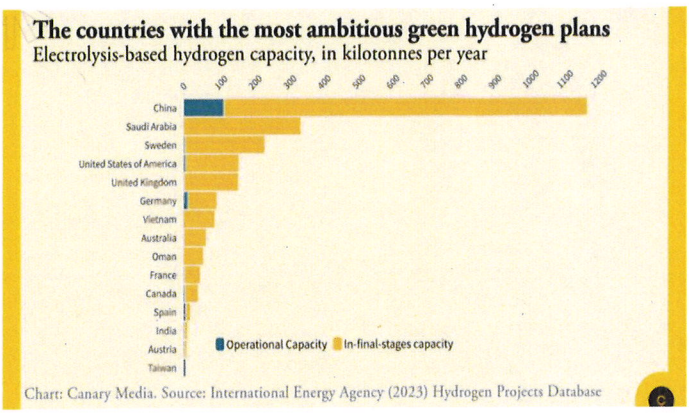
There are numerous ways of transporting hydrogen one way is, liquifying the hydrogen and store place it in super insulated and subzero temperatures tanker trucks. Or they can be transported in the same way but on tube trailers. Then they are transported and vaporized to the desired area, to be used. An additional problem to this process is that when hydrogen is liquified, this consumes more than 30% of the energy. Furthermore, tiny amounts of hydrogen are also lost due to evaporation.

Another way of transporting hydrogen is using pipelines. Over the years Researchers have figured that turning a natural gas pipeline into a hydrogen network is possible. The exterior is made from carbon steel and steel alloys, with a maximum temperature of 221 degrees Celsius. And the interior is made of a pump value, a vacuum jacket, 25 layers of insulation and a process pipe.



Contribution and use of green hydrogen around the world

From the recent years, our study in green hydrogen has created a potential solution to reducing greenhouse gas and carbon dioxide emissions, gaining attention worldwide. This results in a wide range of organizations aiming to use and produce green hydrogen and make an impact on our polluted earth. With almost 2000 organizations around the world, here are 10 of the main ones AMEA power, Linde, First Hydrogen, Lhyfe, Siemens, BP, Plug Power, Air Products and the Neom Green Hydrogen Company is the holds top place, they are currently building the world's largest plant to produce green hydrogen.



blue=operational capacity / yellow= in final stages capacity from top to bottom: China, Saudi Arabia, Sweden, U.S.A, U.K, Germany, Vietnam, Australia, Oman, France, Canada, Spain, India, Austria and Taiwan

Negative and positive aspects of green hydrogen

POSITIVE:

- Green hydrogen is 100% sustainable, as when produced and used, it doesn't emit any greenhouse gases. Since it is only made of renewable energy sources.
- It can be stored for a prolonged time, that you can transport easily in a gas form
- Green hydrogen can be used for many different purposes

NEGATIVE:

- It has high energy consumption and uses vast amounts of flow resources necessary in other ways
- It is a highly flammable gas and creates safety issues when handling it, since it is only formed of 2 hydrogen atoms together, each of them only consists of 1 proton and 1 electron. And since this chemical structure is simple thus, it is commensurately easy to ignite. This is also the reason hydrogen is nontoxic, odorless, tasteless and light.

Conclusion

Green hydrogen plays a significant role in reaching a sustainable energy future. Its purpose distinctly contributes to reducing greenhouse gas emissions, promoting economic growth and elevating our current energy, to replace fossil fuels. But we should be aware that there are challenges we must face, so green hydrogen may not be the main key. But as we know changes will come, and maybe we will have a more efficient way of using hydrogen in the future, and we might have a solution after all...

Word count: 874 (not including titles and references)

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