

# Renewable Energy: Was the right solution under our nose the whole time?

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COVID-19 has forced us to re-think our lives and will certainly have a lasting impact on the way we function in the years to come. While social distancing norms will have to be openly respected and will no longer be considered as 'offensive', similarly, all hesitation with regard to adopting sustainable, environment-friendly solutions in more aspects of life, will no longer be considered as the domain of 'hippies' and 'free-thinkers', but will rather, become mainstream.

Under these extraordinary times, when we are in the process of defining a new normal, let us consider the use of Hydrogen as a commercially viable, clean and renewable fuel source.

Many of us have studied chemistry at school where we learnt the chemical composition of water – which is: two unstable atoms of hydrogen that are neutralised by one atom of oxygen. I'm sure that many of us would have thought that if we could generate energy from water by separating hydrogen and oxygen, wouldn't it be amazing?

Ofcourse our enthusiasm would be literally 'watered down' after learning that it simply did not make fiscal sense to separate the hydrogen and oxygen atoms, plus considering the extreme combustibility of Hydrogen alone it was thought that its applications are best left for limited use in highly controlled environments.

Fast forward to 2022 where numerous innovations have helped makeover Hydrogen's image from a misunderstood, dangerous fossil fuel villain to one that has evolved with time, has managed to hone its temper tantrums for the higher good that can be generated from water.

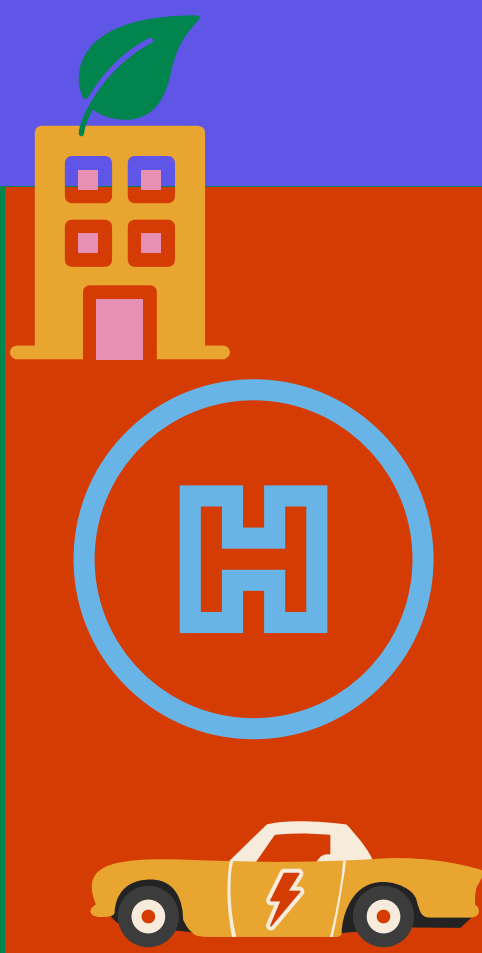
## Global Interest in Hydrogen



Based on recent developments, Hydrogen started gaining some serious global attention at the start of this decade. This interest was formalised with the formation of the Hydrogen Council in 2017 at the World Economic Forum. The fact that in just 5 years, the council membership grew from a handful of companies to 130 members today testifies to the growing interest in this clean fuel source as it is finally starting to become fiscally viable.

A key reason for the numbers to work, is the fact that fewer changes are to be made in the existing eco-system of current appliances and end devices as compared to other renewable energy sources that require compatible devices to function.

## Hydrogen as fuel for transport vehicles



It is no secret that vehicular transportation is responsible for a large chunk of global CO<sub>2</sub> emissions (atleast around 24% according to 2016 data). Therefore, it is a promising industry to help make a case for Hydrogen in the years to come.

Countries such as China have already started using Hydrogen powered trucks for commercial use. Japan is close on China's heels in deploying Hydrogen fuelled commercial vehicles and may soon overtake China in terms of a strategic adoption of Hydrogen in its policies.

Korea on the other hand has undertaken a multi-pronged approach towards Hydrogen to utilise it for heating & cooling applications along with transportation. Korea has a goal to power 10% of the country's cities by 2030 and 30% by 2040.

Both Australia and New Zealand are also working on executing their respective long-term strategies involving Hydrogen. They are looking to build a comprehensive infrastructure related to the generation, storage, transportation of the gas for a number of industrial and commercial uses.

While this may paint a picture of a distant future, as we speak, a lot of interesting work with Hydrogen fuel is already happening commercially. Take the example of Hyundai Motors who have launched their first Hydrogen powered commercial passenger electric vehicle – Nexa which is already running across Britain. Hyundai has made the Hydrogen powered vehicles viable by also undertaking the task of owning and operating Hydrogen fuel stations. These fuel stations are unique in the fact that the fuel is generated onsite from water, and the by-product – Oxygen is released into the air! This is one of the greenest models of Hydrogen fuel generation that end consumers can witness firsthand. Toyota and Honda too have launched their FCEVs (Fuel Cell Electric Vehicles) in the commercial passenger vehicle market.

## So what factors limit the adoption of Hydrogen as a fuel in daily applications?

The answer to this question can be traced back to the source of Hydrogen. While most of us think it should be water, the truth is that nearly 99% of Hydrogen produced today comes from non-renewable sources such as coal and oil. Leaving 1% of the production of hydrogen from renewable sources.

For the numbers to work in order to make Hydrogen a commercially viable fuel, greater adoption of wind, solar and water, in other words, renewable energy sources will enable green production of Hydrogen. While the global trends are shifting in favour of renewable energy sources, it will take a while before Hydrogen production is positively impacted by the green revolution.

## Outlook for Hydrogen

While Electric Vehicles as a trend seems promising to many. In a previous article, we outlined as to how lithium-powered batteries that are a critical component for EV's can play a dampener in the long run. This can happen because of two factors: one, availability of cobalt which is needed to produce lithium. Cobalt is a scarce resource that doesn't come from a renewable source. Much like coal and blood diamonds, Cobalt has a chequered past and in time, EVs powered by lithium based batteries will reach a log-jam in times to come. Second, the advent of Hydrogen powered electric vehicles bypasses the need for batteries altogether. Hydrogen powered engines create their own electricity that powers the vehicle. This effective innovation will render an entire eco-system of lithium powered batteries, quite useless in a decade's time.

The cautious and intelligent thing to do with regards to investment in the Indian EV infrastructure would then be, to stay on top of global developments on newer, sustainable fuel sources. Bear in mind that batteries are the most critical component on which the success of the EV in India stands.