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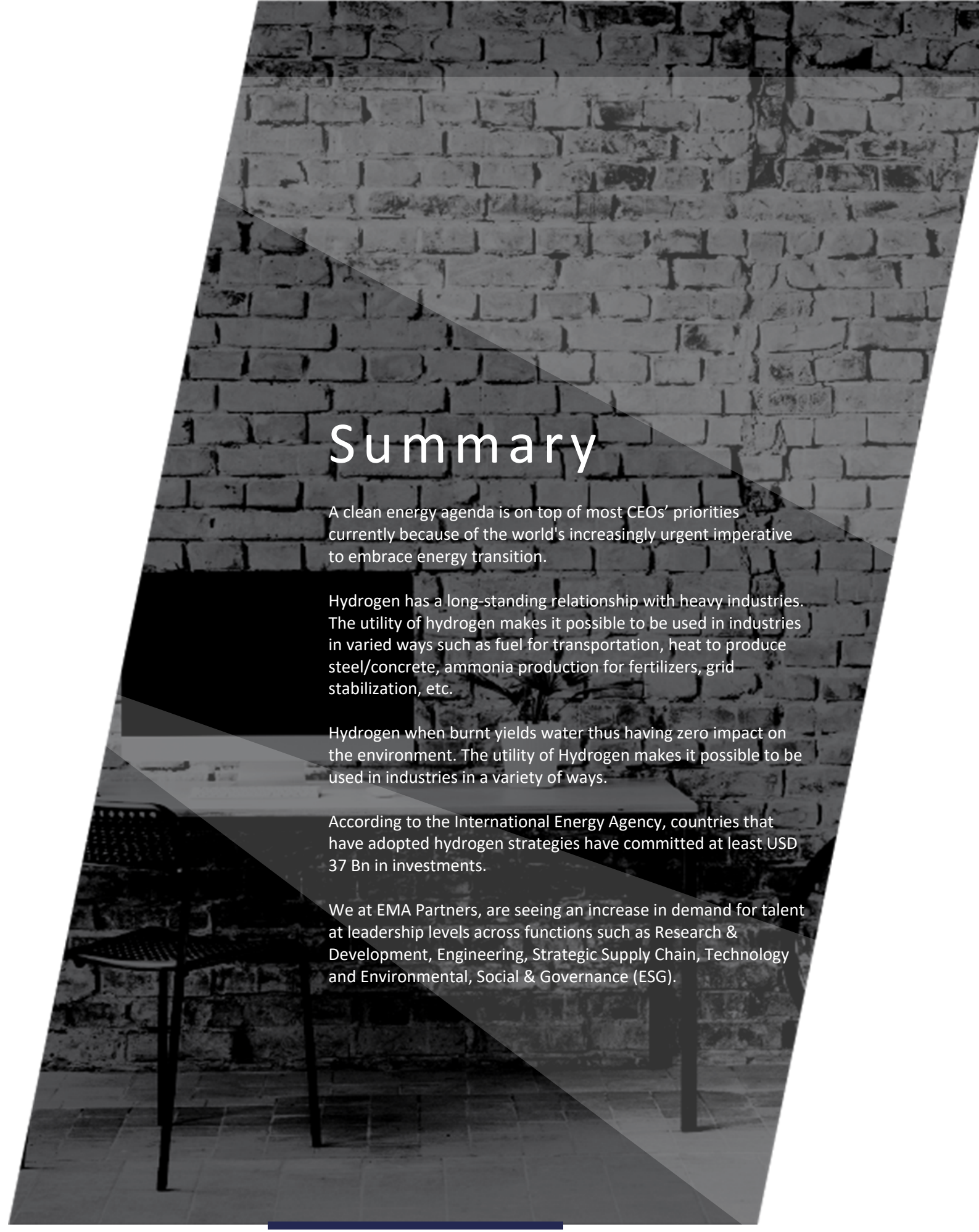
# Industry Outlook



# Summary

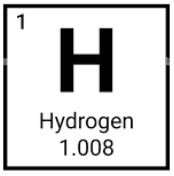
A clean energy agenda is on top of most CEOs' priorities currently because of the world's increasingly urgent imperative to embrace energy transition.

Hydrogen has a long-standing relationship with heavy industries. The utility of hydrogen makes it possible to be used in industries in varied ways such as fuel for transportation, heat to produce steel/concrete, ammonia production for fertilizers, grid stabilization, etc.

Hydrogen when burnt yields water thus having zero impact on the environment. The utility of Hydrogen makes it possible to be used in industries in a variety of ways.

According to the International Energy Agency, countries that have adopted hydrogen strategies have committed at least USD 37 Bn in investments.

We at EMA Partners, are seeing an increase in demand for talent at leadership levels across functions such as Research & Development, Engineering, Strategic Supply Chain, Technology and Environmental, Social & Governance (ESG).




# Green Future

Fossil fuel assets are being replaced by developing low-carbon alternatives. Hydrogen is rapidly emerging as a formidable candidate for alternate energy on a global scale.

## Hydrogen classification

- Black/Brown/Grey hydrogen is created by the gasification of coal or lignite.
- Blue hydrogen is created using natural gas. CO2 that is produced as a by-product is captured leading to a reduction in gross emissions.
- Green hydrogen is created by electrolyzing water with power obtained from renewable sources. The more renewable energy is used in the electrical fuel mix, the "greener" the hydrogen produced.


## Hydrogen?

Hydrogen can be produced in different ways, using fossil fuels or renewable sources. But as opposed to other fuels which produce CO2, hydrogen when burnt yields water thus
having zero impact on the environment.

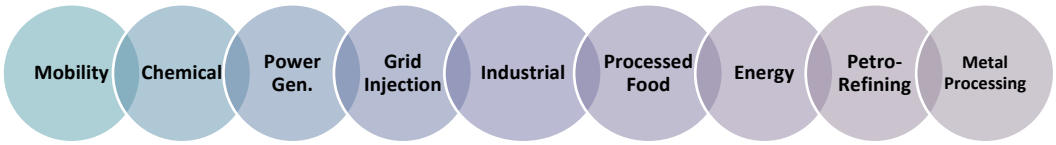
## Why Hydrogen

Hydrogen has a long-standing relationship with heavy industries. The utility of hydrogen makes it possible to be used in industries in varied ways such as fuel for transportation, heat to produce steel/concrete, ammonia production for fertilizers, grid stabilization, etc.

At present, hydrogen is predominantly produced using fossil fuels (almost 95%), resulting in high CO2 emissions. This amplifies the growing need to switch to greener sources of energy to combat global warming.

Decarbonization has become possible in many industries due to the adaption of renewable energy. However, industries such as steel, cement, and chemicals are the most difficult to decarbonize because of the need for high heat, process emissions of CO2 and other factors such as low-profit margins, capital intensity, etc. But these problems are expected to be solved by hydrogen in these hard-to-abate industries.

The following sectors have shown Hydrogen adoption:




## Global Context

Presently, more than 43 countries have rolled out strategic roadmaps toward the development of a hydrogen economy. It has a long-standing relationship with heavy industries. This is largely because of the growing need to decarbonize certain sectors. According to the International Energy Agency, countries that have adopted hydrogen strategies have committed at least USD 37 Bn in investments.

Approximately 200 large-scale projects have been announced along the value chain with most of them being in Europe, Asia, and Australia. These projects are specifically for large-scale industrial usage, transport applications, integrated hydrogen economy, and infrastructure.

Global Cues

200 large-scale projects have been announced along the value chain with most of them being in Europe, Asia, and Australia.

Tracking the developments in the Hydrogen space, the established technologies have shown positive results in recent years. In 2014, Japanese auto giant Toyota launched their first ever hydrogen fuel celled Sedan, Mirai. The vehicle was known to release nothing but water from the tailpipe.

In parallel, other automotive giants such as Hyundai and BMW are also considering hydrogen-powered vehicles. Hyundai is set to re-enter the Japanese market with eco-friendly technology-enabled green cars. Likewise, BMW is planning to co-produce hydrogen fuel cell vehicles in collaboration with Toyota in Japan. Similarly, China is intensively working towards the advancement of hydrogen and fuel cells. Being the world's third largest market for fuel cell vehicles, the country is currently known to produce roughly 25 Mt of the global total. The developments in the hydrogen space unquestionably reinstate credence in alternate renewable energy help achieving net zero targets in the years to come.

# India Impact

India produces most of its hydrogen using fossil fuels, resulting in high emissions.

Impact

'National Hydrogen Mission' was announced by the Ministry of Power in 2021. The policy is intended to enable India to achieve its production goals of 5 Mt of green hydrogen annually and increase the renewable capacity by 2030.

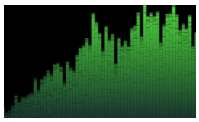
Energy sectors are known to contribute to ~75% of CO2 emissions followed by Agriculture (12%), Industrial (10%) and Waste (~3%). Over the past few years, industries have pledged to significantly cut their carbon footprint.

Numerous policies have been launched in addition to financial support by the government to strengthen the production of green hydrogen in the economy to combat global warming. 'National Hydrogen Mission' was announced by the Ministry of Power in 2021.

The policy is intended to enable India to achieve its production goals of 5 Mt of green hydrogen annually and increase the renewable capacity by 2030. With the green energy movement gaining thrust, Indian business houses are working towards adopting hydrogen as an alternate fuel.

Large conglomerates like Adani Group, Reliance Industries, Tata Group, and others are investing heavily in developing R&D capabilities to commence and eventually sustain the expected technological advancements.

EMA Partners today is working with some of these large conglomerates to identify leaders across the value chain.



# India Invests in Green

India is bullish on Hydrogen, and this can be gauged by the fact that several major Indian multinationals have projects lined up to capitalize on the opportunity.

## In Green They Trust

Adani Group, Reliance, Industries, Tata Steel, ICOL, JSW Group, and ACME Group have announced their commitment to Go Green.

### Adani Group

- The group will invest USD 50 Bn by 2030 on infrastructure for green hydrogen.

### Reliance Industries

- The company will devote USD 10 Bn to renewable energy in order to commercialise hydrogen technology and create a supply chain in cooperation with other Indian players. The company has partnered with the US-based Chart Industries to form the India H2 Alliance.

### Tata Steel

- Tata Steel has signed agreements for the production of steel using hydrogen in the Dutch city of Ijmuiden with McDermott, Danieli, and Hatch.

### IOCL

- The firm formed a JV to create green hydrogen with 2 commercial businesses. Additionally, there are plans to produce and market the electrolyzers needed to produce green hydrogen.

### JSW Group

- Sajjan Jindal-led group is collaborating with Australia-based Fortescue Future Industries. The company plans to use green hydrogen technology to decarbonize its steel manufacturing operations.

### ACME Group

- The Group recently announced that it is planning to build one of the largest green ammonia projects in the world (with a USD 3.5 Bn budget) at the SEZ in Oman.

# Talent Landscape

Hydrogen is expected to expand in scope and adoption, demanding a greater need to onboard the right talent with expertise to advance new procedures and innovation.

Many of the principles and challenges across the green hydrogen value chain including sourcing renewables, electrolysis, storage, transportation etc., are relatively well-known. However, delivering these solutions at the right cost and time can and will be challenging. A critical factor for organizations to succeed in this uncharted territory will be having the right talent.

Our service portfolio is rooted in a rigorous understanding of the business context.

Some of the sectors to looking for talent for Hydrogen can be Industrial Gas, Renewable Energy, and Exploration & Production (E&P). The Automotive industry is another sector, where organizations have been investing heavily in Research & Development to power fuel-cell vehicles. Clearly,
multinational companies as well as Indian business houses are working towards mapping global talent and onboarding the right leaders to get ahead in the game.

We at EMA Partners (www.ema-partners.com), are seeing an increase in demand for talent at leadership levels across functions such as Research & Development, Engineering, Strategic Supply Chain, Technology and Environmental, Social & Governance (ESG).

We are trusted partners to several global MNCs, Indian corporate houses, and Private Equity & Venture Capital funded organizations. EMA Partners' domain specialists add clarity to every engagement that is designed to give enduring business outcomes.

# End Note

Hydrogen can play a significant role in India's energy transition by improving its industrial competitiveness, boosting economic development, and reducing CO2 emissions.

The overall atmosphere is also favoring businesses that have put ESG objectives first. With proper policy support, industry action, and increased investor interest, India can position itself as a low-cost, zero-carbon manufacturing hub.

## Authors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