



Indian Market Opportunity in Green Hydrogen and Fuel cells

ABOUT US

Indian Market Understanding + Technical Knowhow =



Started in 2009, Quanzen is your consultant and market development partner in India.

Based in Pune, the Automotive hub of India.

Part of [Global Alliance Automotive](#) – a worldwide network of Local Market Support companies across 15 countries



QUANZEN

WHY INDIA SHOULD BE YOUR NEXT DESTINATION?



A background image showing a person from behind, wearing a dark grey t-shirt and red sunglasses, driving a car. The steering wheel and dashboard are visible in the foreground.

Green Hydrogen and Fuel cells - Huge Emerging Opportunity

AGGRESSIVE TARGETS WILL LEAD TO MASSIVE GROWTH



- 1. India has the target of achieving 450 GW of renewable energy by 2030**
- 2. Ultimate aim of the government is to bring down the cost of green hydrogen to \$1 per kg and have 5 million metric tonne per annum (MMTPA) green hydrogen capacity by 2030 in India.**
- 3. Greenfield market with massive growth potential**
- 4. Growing H2 demand with local as well as export opportunities**

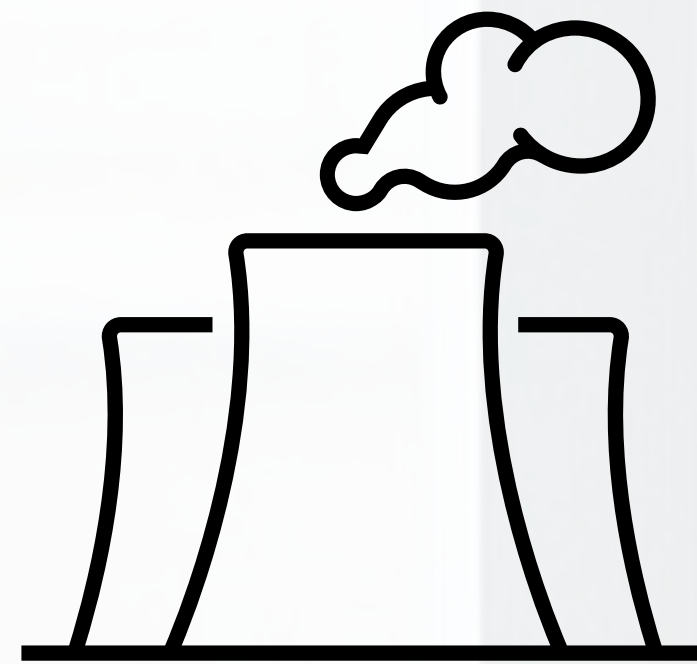


- 1. National Hydrogen Mission**
- 2. Government Incentive Scheme**
- 3. Investments from Local & Global players and Government bodies**



National Hydrogen Mission

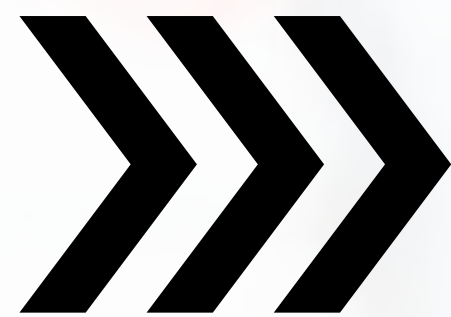
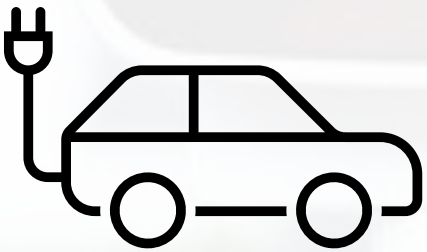
- On 15 August 2021, Prime Minister announced the launch of National Hydrogen Mission (NHM). The broad objective of the mission is to scale up Green Hydrogen production and utilisation and to align India's efforts with global best practices in technology, policy and regulation.
- The government in its Union Budget has allocated \$200 Mn for Indian Renewable Energy Development Agency (IREDA) and the National Hydrogen Mission in 2022 for generating Hydrogen from green energy sources.
- The main objective is to make India the new global hub of green hydrogen.



Government Incentive Scheme on Hydrogen and Fuel cells.



- A production-linked incentive scheme of \$ 2 Bn is being worked out to push for **electrolyser manufacturing in India.**(timeline for the scheme is expected to be 5 years starting FY24)
- A \$ 3.5 Bn PLI scheme to steer automotive sector towards electric, hybrid and fuel cell vehicles.



Investments from Local & Global players and Government bodies



BloombergNEF says, by 2030, green hydrogen production costs in India could be lower than fossil fuel-derived hydrogen.

Local players as well as Government bodies already announced mega projects. Many others are keen to enter. Here are some examples

Bharat Petroleum Corporation (BPCL) will soon float a tender for a 20 MW electrolyser to build the country's largest green hydrogen plant

Adani Group – one of India's largest players in the infrastructure and energy sectors, has announced their plan to develop Green Hydrogen Projects in India, with an investment of \$20 billion in clean energy generation, component manufacturing, transmission and distribution over 10 years,

Reliance Industries, one of the biggest Indian companies with USD 200 Billion market capitalisation, announced in June 2021, its plan to invest USD 10 Billion over next 3 years in 4 Giga Factories for Renewable Energy Eco system in India. Reliance aims at 100 GW renewable energy by 2030, bring hydrogen costs under \$1

Investments from Large Local players and Government bodies



GAIL (India) has ambitious plans with respect to green hydrogen. It plans to build a green hydrogen plant with 10MW electrolyzer as it looks to supplement its natural gas business with carbon-free fuel.

NTPC, India's largest power generation company has big plans for Hydrogen fuelled vehicles. They are also assessing, replacing Diesel Generator Sets with minimum 500 kW hydrogen-based fuel cell system for backup power at the NTPC premises and establishing green power based 50 kW microgrid based on electrolyzer-fuel cell combination

Ohmium International, through its Indian subsidiary, has shipped its first unit of electrolyzer from India to the United States, as a first step towards establishing India as a global hub for green hydrogen generation

Investments from Large Local players and Government bodies



Indian Oil Corporation (IOC) India's largest oil firm will build the nation's first 'green hydrogen' plant at its Mathura refinery, as it aims to prepare for a future catering to the growing demand for both oil and cleaner forms of energy.

L&T (India) county's leading infrastructure developer to invest up to \$700Mn to implement and adopt green energy. The company is also planning to use some bio-fuels and evaluating setting up a green hydrogen plant in Hazira, India by the end of FY22

Australia-based Fortescue Future Industries has partnered with JSW Energy arm on green hydrogen production and application in India.

Fuel cells developments

- **Tata Motors, biggest Indian vehicle manufacturer, starts Hydrogen Fuel Cell vehicle manufacturing journey as it bags order for hydrogen-based fuel cell buses from Indian Oil Corporation Ltd (IOCL)**
- **Reliance Industries, India's largest retailer, will replace transportation auto fuels with clean electricity and hydrogen as it set a target to become net carbon-zero by 2035.**



India as a Global hub for Green Hydrogen!



A huge growth opportunity is opening up for all global players in the green hydrogen domain – manufacturers, component suppliers and technology providers for green hydrogen, electrolysers, fuel cells as well as refuelling systems, storage & transportation systems, etc.





QUANZEN

Quanzen Services LLP

response@quanzen.com

<https://www.quanzen.com/>