

# GREEN HYDROGEN

The Fading Footprints of Carbon

**Prepared and Presented by:**

Matrugupta Mishra

Managing Partner, Ritam Legal



# India: National Hydrogen Mission

*“Of every effort being made by India today, the thing that is going to help India with a quantum leap in terms of climate is the field of Green Hydrogen. To achieve the goal of Green Hydrogen, I am announcing the National Hydrogen Mission today with this tricolour as a witness.”*

*- Prime Minister Narendra Modi*

*(75<sup>th</sup> Independence Day addressed from the Red Fort, 15 Aug 2021)*

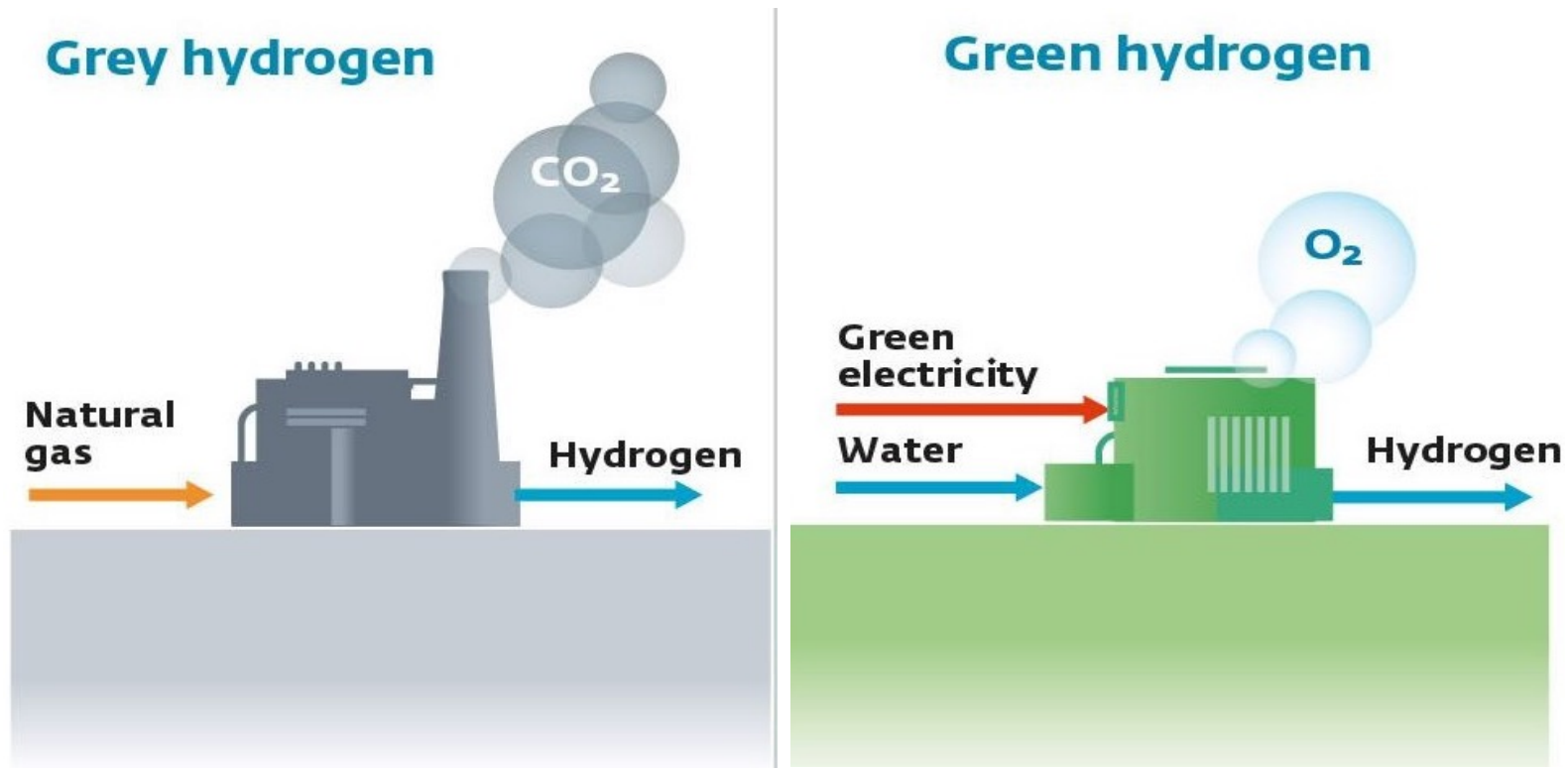


# WHAT IS GREEN HYDROGEN

- ▶ Green Hydrogen is hydrogen produced by the utilisation of Renewable sources of energy (Wind/Solar etc.) through the process of Electrolysis.
- ▶ Hydrogen has the highest energy content of any common fuel by weight (about three times more than gasoline), but it has the lowest energy content by volume (about four times less than gasoline).
- ▶ Hydrogen produced conventionally is referred to as Grey Hydrogen, primarily done through the usage and burning of fossil fuels which emits CO<sub>2</sub> in large quantities.



# Green vs. Grey Hydrogen



# HOW IS IT RELEVANT

- ▶ Hydrogen being a versatile fuel can be used for a variety of purposes - whether for generation of electricity or as fuel for generation of energy where electrification is not possible eg. Heavy Machinery, Maritime vessels, Planes, Vehicles, Fertilizers etc.
- ▶ Ease of Storage & Transportation - 100% Sustainable
- ▶ Green Hydrogen has zero carbon content, is a non-pollutant source of energy and combustion of which leaves behind only water vapour.
- ▶ Will constitute up to 6% of total energy consumption by 2050.
- ▶ Will help decarbonise sectors such as shipping and transportation while at the same time also be used as important raw material for manufacturing.



- ▶ India has a huge edge in Green Hydrogen production owing to favourable geographic conditions and the presence of abundant natural elements.
- ▶ Possible areas include suitable mandates for use of green hydrogen in industry such as fertilizer, steel, petrochemicals etc. Major activities envisaged under the Mission include:
  - creating volumes and infrastructure;
  - demonstrations in niche applications (including for transport, industry);
  - goal-oriented Research & Development; facilitative policy support;
  - putting in place a robust framework for standards and regulations for hydrogen technologies



# However....

- ▶ Extremely High cost of Production
- ▶ High Energy Usage
- ▶ Safety Hazards



# Green Hydrogen Policy

- ▶ The Policy (17.02.2022) aims to facilitate the transition from fossil fuel/ hydrocarbons to green hydrogen & green ammonia.
- ▶ Provides for waiver of Inter-State Transmission Charges for 25 years to producer from projects commissioned before 25.06.2025.
- ▶ Producing plants will be granted open access within 15 days of receipt of application.
- ▶ 30 days of RE banking permitted for producers.
- ▶ Land in RE parks can be allotted for production.
- ▶ GOI proposes for setting up of manufacturing zones.
- ▶ RE consumed shall count towards RPO of consuming entity. Beyond such threshold, it shall be counted towards the RPO compliance of the DOSCOMs where such project is situated.





# Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022

- ▶ MoP Notification (06.06.2022) - framed Electricity (Promoting Renewable Energy Through Green Energy Open Access) Rules, 2022 which has come into effect from the date of publication.
- ▶ 2(d) “green energy” means the electrical energy from renewable sources of energy including hydro and storage (if the storage uses renewable energy) or any other technology as may be notified by Government of India from time to time and shall include ant mechanism that utilises green energy to replace fossil fuels including production of green hydrogen or green ammonia as per provision of Clause G of sub rule (2) of rule 4;
- ▶ 2(e) “obligated entity” means the entities mandated under clause (e) of sub-section (1) of section 86 of the Act to fulfil Renewable Purchase Obligation, which includes distribution licensee, captive user, and open access consumer
- ▶ Rule 4(1) prescribes uniform Renewable Purchase Obligation on all obligated entities in area of a distribution licensee.
- ▶ Rule 12(2) prescribes Forum of Regulators to frame methodology for calculation of open access charges, as well as banking charges within four months.
  - ▶ Pursuant to which FoR framed Model Regulations (Sep, 2022) on Methodology for calculation of Open Access charges and Banking Charges for Green Energy Open Access Consumers



# INITIATIVES ACROSS JURISDICTIONS

- ▶ Japan: In 2017, it promulgated national hydrogen strategy seeking to decarbonise its economy and it rolled out Environmental Innovation Strategy (2020) which included hydrogen in technological innovative efforts including storage related and energy carrier technology.
- ▶ California recently adopted Senate Bill No. 1075 (2022), which considers green electrolytic hydrogen as an eligible form of energy storage and to consider green electrolytic hydrogen in their decarbonization strategies.
- ▶ EU Directive 2018/2001 (Renewable Energy Directive) of the European Parliament on the promotion of energy from renewable sources provides that hydrogen from renewable sources shall be considered for calculation of share of energy from renewable sources (Article 7).



# INITIATIVES ACROSS JURISDICTIONS

- ▶ United Kingdom: Announced its plans to achieve 5GW of low-carbon hydrogen production capacity by 2030. Pursuant to which, a white paper (Dec, 2020) was published providing recommendations on the decarbonization of electricity system by 2035 promoting green hydrogen.



# To Be Achieved...

- ▶ Energy Independent Nation by 2047 with alternative to Fossil Fuel
- ▶ Hydrogen Demand @ 6 MTPA in 2020 - Estimated @ 28 MT by 2050 - 80% Green
- ▶ Cost to be reduced by 50%
- ▶ Export to South East Asian Countries & Europe
- ▶ Hydrogen Fueled Buses and Heavy Vehicles



# Current Approach: Policy/Rules/Regulation

- Regulatory Certainty and Executive Sensibility
- Discouraging: Executive Law Making
- Executive to function within the Legislative Framework
- Legislative Drafting: Decorum & Discipline
- Green Hydrogen as a substitute of fossil fuel requires a nodal agency and a Comprehensive Enactment.
- Green Hydrogen to be utilised for generation of electricity can still be governed under the existing framework of Electricity Act by treating it just as a renewable energy.
- Scientific Innovation & Legislative/ Policy Alignment



**THANK YOU!**

