

## ERGO

*Analysing developments impacting business*

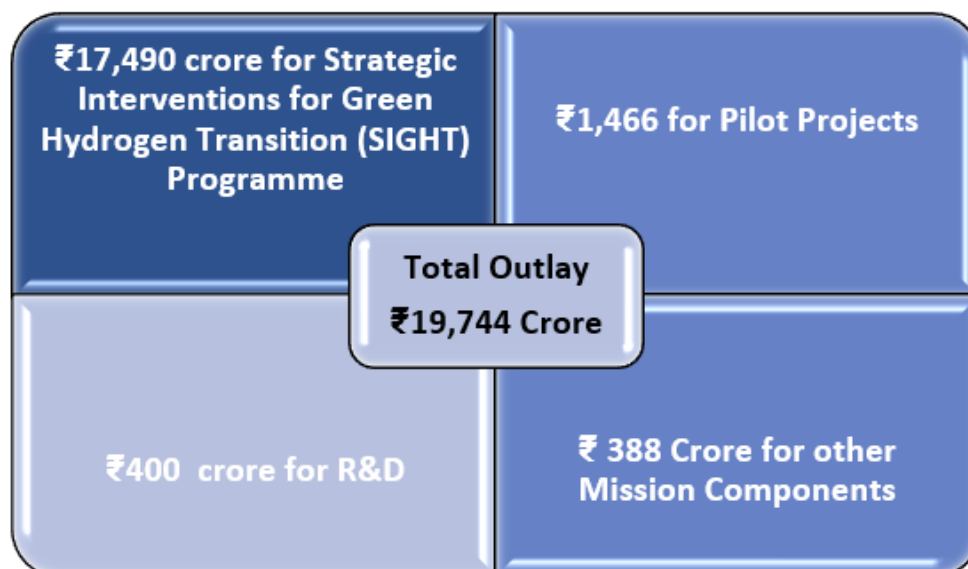
### NATIONAL GREEN HYDROGEN MISSION

19 January 2023 A 'National Hydrogen Mission' was first conceptualised in the Union Budget of 2021. Later in the Independence Day speech, the Hon'ble Prime Minister formally announced the launch of National Hydrogen Mission. Following which the Ministry of Power on 17 February 2022 issued a Green Hydrogen Policy. Please refer our earlier Ergo Update on the Green Hydrogen Policy [here](#). On 13 January 2023, the Government of India released the details of the National Green Hydrogen Mission (Mission) wherein it has been set out that the Government will commit INR 19,744 crore to make India global hub for production, utilisation and export of green hydrogen and its derivatives. The Ministry of New and Renewable Energy (MNRE) has been assigned the responsibility for overall coordination and implementation of the Mission.

The Mission provides a roadmap for 2030, to make India a global hub for production, usage and export of green hydrogen and a framework for creation of a comprehensive green hydrogen ecosystem. Renewable energy being, green hydrogen ecosystem's backbone, the Mission would be backstopped by India's 500 GW renewable energy capacity addition programme to be achieved by 2030. Some of the expected outcomes of the Mission, which the Government intends to achieve by 2030 are:

- Development of green hydrogen production capacity of 5 MMT per annum entailing INR 8 trillion investments;
- Renewable energy capacity addition of 125 GW;
- Creation of 0.6 million jobs; and
- Abatement of 50 MMT of annual greenhouse gas emissions.

#### ***Breakdown of the financial outlay***



- **SIGHT Programme-** The SIGHT Programme would focus on development of domestic manufacturing units for the electrolyzers and other technology along with production of green hydrogen. Under the SIGHT Programme, the Government has proposed a two financial incentive mechanism, one targeting domestic manufacturing of electrolyzers and the other for green hydrogen production.
- **PILOT Projects-** Government would set up pilot projects in the sectors with potential to adopt and transition to green hydrogen such as steel, heavy duty mobility, shipping etc.
- **Research and Development (R&D) -** Given that the technology associated with green hydrogen is evolving and in its nascent stage, the Mission underpins the importance of innovation to increase the affordability of green hydrogen production, storage, transportation and utilisation. An R&D programme will be carried out in consultation with Council for Scientific and Industrial Research wherein identified projects will be provided support.

### Phased Implementation

Aware of the nascency of the green hydrogen sector, the Government has adopted a phased approach for addressing the major thrust areas for creation of a robust green hydrogen ecosystem. The focus areas of the two phases envisaged is as follows:

#### Phase I (2022-23 to 2025-26)

- The key focus area in this phase would be creation of demand of green hydrogen and bringing down the cost to allow greater deployment in the next phase.
- Creation of demand with specific focus on refinery, fertiliser and city gas sectors.
- Laying foundation for future transition in hard to abate sector and development of pilot projects in steel production, heavy duty mobility and shipping sectors.
- Establishing frameworks and defining standards and norms.

## Phase II (2026-27 to 2029-30)

- Initiatives for wider diffusion of green hydrogen to newer sectors to move towards a carbon neutral economy.
- Commercial scale green hydrogen projects in the steel, mobility and shipping sectors and to develop pilot projects in other potential sectors like railways, aviation etc.
- Relying on demand creation and evolution of cost of green hydrogen in the first phase, Government intends to scale up the R&D activities for continuous development of green hydrogen.

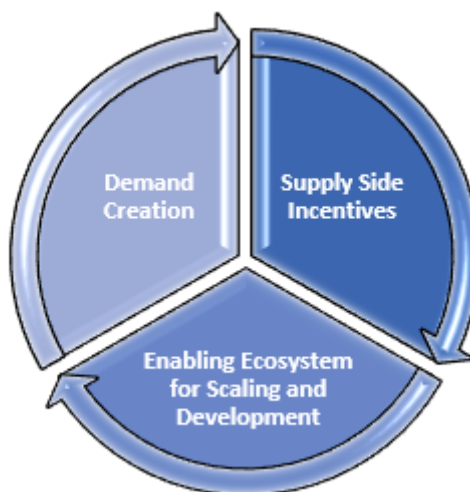
### Mission Governance

Given that the success of green hydrogen would depend on the integration of other sectors, the Mission provides for an integrated strategy with various ministries agencies and institutions of the Central and the State Government working in tandem for the success of the Mission. The MNRE would be the primary ministry responsible for the overall coordination and implementation of the Mission.

Since electricity would be one of the key inputs for a green hydrogen project, Ministry of Power, (which had earlier issued the Green Hydrogen Policy), would be responsible to implement policies and regulation for delivery of renewable energy to green hydrogen production projects and for development of power system infrastructure. Further, ministries dealing with petroleum and natural gas, steel, roads, etc would facilitate uptake of green hydrogen in respective sectors. An Empowered Group comprising representatives from different ministries and industry experts is proposed to be set up for overall implementation of Mission objectives.

### Principal Components of the Mission

The development of green hydrogen across the globe is in its incipient state. Cognizant of this, the Government in the Mission has identified various component which it would be addressing for creation of strong foundation for promoting India as a global hub of green hydrogen and evincing investor interest. The Mission would be focusing its strategy and intervention on the following components:



Recognising that the success of any large-scale mission with huge capital outlay would hinge on an enabling policy and regulatory framework, the Mission provides a comprehensive mechanism on how Government would be providing impetus to each such component. For example, financial incentives for electrolyser manufacturing and green hydrogen production are envisaged for creation of supply side push.

#### **Policy and Regulatory Framework**

Given that development of renewable energy would lay the foundation for development of green hydrogen ecosystem, the Mission continues on the Green Hydrogen Policy by extending support for renewable energy as input-waiver of inter-state transmission charges, energy banking and time bound grant of open access and connectivity.

With respect to land for setting up of green hydrogen and other derivatives manufacturing plant, the Mission provides that the existing scheme on solar parks, manufacturing zones, and special economic zones could be extended to cover green hydrogen related activities.

Realising that availability of finance for the new sector where performance standards are yet to be established would be a challenge, the Mission bats for exploring various policy measures and initiatives for accessing low-cost funds through international green finance, green bonds and other innovative financial mechanisms. Similar to the renewable project, the Mission proposes competitive bidding for procurement of green hydrogen and its derivatives, and MNRE is entrusted with the responsibility of framing the guidelines for transparent competitive bidding process. Awarding of long-term contracts for procurement of green hydrogen, post competitive bidding would provide stability to producers and will also incentivise lender for financing the hydrogen projects.

#### **Risk Management**

Any sunrise industry comes with its own set of risk and challenges and considering budding nature of the green hydrogen sector with a flurry of activities going in the R&D of green hydrogen across the globe, such risks and challenges becomes manifold. One of the challenges with respect to green hydrogen, may be related to water supply, since water is the primary feedstock for production of green hydrogen through electrolysis. The Mission as a mitigation measure for the above states that the location of the renewable energy projects and the green hydrogen projects would be optimised and the use of industrial or municipal wastewater will be emphasised.

To address the logistical and supply chain risks associated with green hydrogen, the Mission provides for creation and promotion of hydrogen hubs which are regions with a capability of creation of cluster-based production and utilisation model to enhance the viability of green hydrogen projects. Under the Mission, the Government plans to set up 2 such hubs in the initial phase.

#### **Demand Creation**

In order to create bulk demand and scale up production of green hydrogen, the Mission empowers the Government to specify minimum share of consumption of green hydrogen or its derivative products (green ammonia, green methanol etc) as energy or feedstock for different consumers. The Government would lay down a year wise trajectory for such minimum share of consumption similar to a renewable purchase obligation (also referred to as RPO) in the renewable energy industry. The Mission moots for creation of legal provision for ensuring enforceability of consumption targets for industry to use green hydrogen and its derivatives through the Energy Conservation Act, 2001. It is pertinent to mention that the parliament had recently passed the Energy Conservation (Amendment) Bill, 2022, which had mandated certain industries to meet their proportion of energy needs from non-fossil sources. Creation of legal mandate to certain industry for mandatory consumption of green

hydrogen, akin to the present renewable purchase obligation will provide stimuli to green hydrogen production units.

## **Comments**

The roll out of the Mission is a step in the right direction which would provide impetus to the India's goal of becoming energy independent by 2047 and to achieve net zero emission by 2070. India's energy consumption has been rapidly increasing and its is estimated to grow by another 25% by 2030.

India consumes around 5 MMT of hydrogen annually, which is currently sourced primarily from fossil fuel (Grey Hydrogen). Grey Hydrogen is much cheaper compared to its green counterpart. However, green hydrogen has a bright future, as an enabler of renewable energy systems and its ability to decarbonise end users to its potential use to fuel combustion engines. It is expected that green hydrogen will be competitive with Grey Hydrogen in the coming years.

Given that India's renewable energy market is 4<sup>th</sup> globally and is rapidly growing, the same provides a fertile ground for development of the green hydrogen market. Just like the National Solar Mission which played a significant role in the development of the solar industry in India, the Mission can be envisaged to play a significant role in the development of the green hydrogen market. Provision of financial incentives and other benefits would de-risk the first movers and will go a long way in helping scale the sector. The development of the entire value chain through collective commitment of the stakeholders to create a sustainable ecosystem will be a key in successful implementation of the Mission leading to reduction in emission and protection of environment.

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