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# ICRA's CLIMATE SERIES
# Green Hydrogen

## Waiving of Inter-State Transmission System charges to cut Levelised Cost of Hydrogen by 15-20%, savings up to Rs 0.3 trillion pa

**June 2023**

**CLIMATE CHANGE**

The biggest crisis of our time

# Overview

*Hydrogen applications are foreseen as one of the major strategies in a document submitted by GoI to UNFCC for achieving climate goals and net zero targets.*

*Initiative on waiving of ISTS charges is expected to cut LCOH by 15-20%, generating savings up to Rs 0.3 trillion pa.*

- Hydrogen applications are foreseen as one of the major strategies in Long Term Low Greenhouse Gas Emissions Development Strategy (LT-LEDS) - which was submitted by India with the United Nations Framework Convention on Climate Change (UNFCCC). LT-LEDS lays down India's short-term and long-term action plans for achieving climate goals and net zero targets.
- The Government of India (GoI) is taking various initiatives to facilitate transition and support setting up a Green Hydrogen eco system in India.

- Being a sunrise sector, the approved outlay of Rs. 197 billion under the 'National Green Hydrogen Mission' has subsidies for production, capex, R&D, pilot projects and also skill development programmes.

- Initiative on waiving of Inter-State Transmission System (ISTS) charges is expected to cut Levelised Cost of Hydrogen (LCOH) by 15-20%. Considering the target of the National Green Hydrogen Mission of 5 MMT pa by 2030, this waiver can save up to Rs 0.3 trillion pa.
- On May 29, 2023, the GoI extended the timeline for the waiver of ISTS charges on domestic manufacturing by five years (till 2030) considering the current progress. There will also be subsidised ISTS charges for three years (from 2031 till 2033), post the waiver.
- As the cost of electricity and electrolysers falls, the efficiencies of electrolysers improve, and the average load factor for renewables improves, the cost of Green Hydrogen is expected to fall. This may result in higher savings (because of waiver/concession) for later years.

*Source: ICRA Research*

# Overview

*Initiatives by the GoI for setting up a Green Hydrogen ecosystem in India have an inclusive approach.*

*However, close monitoring and regular interventions needed for successful implementation.*

- To encourage capex, the GoI could consider direct financial incentives (like the PLI scheme) for electrolyser manufacturing, which has massive capex requirements of Rs 8-9 trillion.
- Moreover, consideration of lower import duties on electrolysers till the time domestic manufacturing picks up, may help in the interim period.

- Other initiatives like purchase obligation of Green Hydrogen (HPO) and benefit of Renewable Purchase Obligation (RPO) for Green Hydrogen manufacturers will help in transition and penetration for the sector.
- Subsidies to pilot projects and funding for R&D will help calculate the preparedness of the technologies and other infrastructure.
- Easy access to renewable energy, storage facility and faster clearance of approvals will help the initial concerns of the business set up.

- Initiatives taken by GoI, are steps in right direction. However, close monitoring and regular Government interventions are necessary for achieving long-term goals and targets on hydrogen strategy.

*Source: ICRA Research*

# Hydrogen application foreseen as long-term strategy for achieving NDCs

The LT-LEDS, submitted with the UNFCCC by India, articulates India's strategy and action plan in the short and long-term to achieve its Nationally Determined Contributions (NDCs) goals by 2030 and the target of net zero emissions by 2070.

**Major elements of Long-term Low-Emissions Development Strategies**

**Hydrogen applications are foreseen as one of the long-term strategies in power, transport and industry - contributing ~90% of Co2 emissions**

**Low carbon development of electricity systems**

- **Hydrogen supported by fuel cells** can be used **for renewable energy storage,** which can be converted back to electricity whenever required. Hydrogen has more storage capacity because it has low volumetric energy density compared to other energy sources *(it can store more energy in lesser space)*
- Hydrogen fuel cells **can be used in gas turbines to increase power system flexibility**

**Low-carbon transport system**

- Penetration of **hydrogen fuel cell vehicles**

**Low-emission industrial system**

- If industries opt for green ammonia, it can save natural gas import cost. ~15% of the annual ammonia consumption is met through imports.
- Use of hydrogen in the steel industry could substitute imported coking coal

*Source: United Nations Framework Convention on Climate Change (UNFCCC), Industry, ICRA Research*

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# Thank You!