

India's green hydrogen economy to operate at scale, fall in costs expected: Minister R K Singh

New Delhi, 8 September 2021: "Green hydrogen could play a critical role in meeting India's growing energy needs, reducing our dependence on energy imports, and also healing the environment. Our government's mantra is to electrify the economy and green the electricity. But there are sectors where electrification will not work. Hence, we are committed to creating a green hydrogen economy that operates at scale, just like we did for renewables. This will also help to bring down the costs of green hydrogen," Union Minister for Power and New and Renewable Energy, Shri R. K. Singh, said today at a virtual event organised by the Council on Energy, Environment and Water (CEEW).

Shri R. K. Singh added, "Green hydrogen could also play a critical role in decarbonising the heavy-duty transport sector, especially given that batteries are not yet economically viable for this application. Our government plans to offer viability gap funding towards this effort. Further, we plan to convert two ships to run on green ammonia as pilot projects."

He further said that the government is working to develop mandates for green hydrogen blending in refineries, fertilisers, and city gas networks. These would create the necessary demand and lead to economies of scale for critical technologies like electrolyzers. The government is also developing a Production-Linked Incentive (PLI) programme to support the indigenisation of electrolyzers. The initiative would target the establishment of 10 GW of domestic manufacturing capacity.

Union Minister of State (New and Renewable Energy, Chemicals and Fertilisers) Shri Bhagwanth Khuba was also present at CEEW's virtual event.

Shri Indu Shekhar Chaturvedi, Secretary, Ministry of New and Renewable Energy (MNRE), said, "Green hydrogen is globally seen as a promising avenue for driving decarbonisation. The MNRE has been working on a comprehensive mission document with the aim of scaling up green hydrogen production and utilisation in India. The broad vision is to develop indigenous capabilities and lower costs to accelerate green hydrogen adoption in various areas of potential use. Key areas of focus include creating demand in market instruments, developing domestic manufacturing capacity, establishing facilitative policy and regulatory frameworks, building production and supply infrastructure, and carrying out research and development."

Arunabha Ghosh, CEO, CEEW, said, "India is poised to play a vital role in the global hydrogen economy. Many countries in the tropics, including India, are favourable locations for lower-cost green hydrogen production. The recently announced National Hydrogen Mission has also provided a timely boost. Scaling up green hydrogen could be a game-changer for India's heavy industries, such as steel, ammonia and petrochemicals, in addition to long-distance freight transport and energy storage."

He further said, "India must consider designing and setting up, with partner countries, a multi-country and multi-institutional Global Green Hydrogen Alliance which could assess, develop and design affordable green hydrogen technologies that can be deployed at scale. Such an Alliance would build and maintain a *global inventory* of hydrogen programmes, pursue periodic technology assessments, pool funds for enhanced joint R&D, establish rules of intellectual property ownership and licensing, and set standards and protocols."

A new, independent CEEW study 'Greening Steel: Moving to Clean Steelmaking Using Hydrogen and Renewable Energy' was also launched at the event. The study, supported by the Shakti Sustainable

Energy Foundation (SSEF), highlighted that making steel with a 9 per cent blend of green hydrogen would reduce its emissions footprint by as much as 68 per cent compared to the conventional blast furnace process. Further, this green steel type would remain competitive with the upper range of conventional steel costs at current rates in India.

The CEEW study also highlighted that steelmaking based entirely on green hydrogen could break even with coal-based processes in India if green hydrogen costs fell to 1.3-2.2 USD/kg from the current 4-4.5 USD/kg. Globally, electrolyser manufacturers have already committed to a green hydrogen cost of 1.5 USD/kg by 2025. However, the commercialisation of green steelmaking in India is subject to favourable access to both wind and solar resources at plant locations, lower renewable energy tariffs, and significant price reductions in electrolyser and storage technologies.

Deepak Yadav, Programme Associate, CEEW, and lead author of the study, said, “Until steelmaking based entirely on green hydrogen becomes cost-competitive in India, the steel industry should incrementally increase green hydrogen blends in manufacturing processes. Further, India should prioritise investments in hydrogen-ready technologies like shaft furnaces. The existing coal-based technologies are not hydrogen-ready, and any further investments in blast furnaces will lock in demand for imported coal till mid-century and beyond.”

The CEEW study recommends setting up a pilot green steel plant in India to promote domestic expertise in using hydrogen for steelmaking. Policy changes that nudge Indian steelmakers to institutionalise high R&D spending and participate in technology collaboration and pilots must also be pursued. Finally, the hydrogen economy will need support from regulatory drivers like strict emissions norms and a pricing mechanism that penalises polluting fuels and incentivises cleaner alternatives.

Last month, Prime Minister Narendra Modi announced the National Hydrogen Mission and his vision to make India a global green hydrogen production and export hub. In recent months, leading Indian companies have expressed interest in scaling up green hydrogen.

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About CEEW

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