



Impact of the new green hydrogen pilot project guidelines on India's transport sector

India ranks as the third-largest energy consumer globally, even though its per capita consumption is only about one-third of the worldwide average. The energy mix dominated by fossil fuels was the leading cause of its energy-related emissions in 2023, which totaled about 2.8 billion tons of CO₂. Indian transportation is a vital pillar for the energy transition, however it is also the third largest emitter of carbon dioxide after electric and industrial power emissions accounts for 12-13%. The transportation sector's heavy dependency on oil serves as a hindrance to decarbonization. Currently oil expenditure makes up 40-50% of India's total oil consumption.

The need for passenger and freight transportation is expected to increase significantly in India as a result of growing demand, disposable income, and commercial and industrial activity. Decarbonizing transportation through low-carbon technologies is therefore the primary objective for the sector.

Hydrogen can be a game-changer in the quest to decarbonize the transport sector

Hydrogen is increasingly recognized as a most refined and clean fuel when produced through electrolysis employing renewable energy sources, such as wind, solar, or hydropower. Thus, this approach of hydrogen production ensures that the generation of hydrogen does not leads to greenhouse gas emissions, enhancing its capability as a sustainable energy carrier.

Hydrogen-based technologies, particularly Fuel Cell Electric Vehicles (FCEVs) and Hydrogen Internal Combustion Engines, hold significant ability as effective solutions for decarbonization across various sectors.

While [hydrogen fuel cells](#) have yet to go mainstream, they are predicted to have an explosive effect on long-haul transport, especially in heavy-duty trucking where weight and efficiency-related challenges hamper traditional battery-driven electric powertrains. Thus, the implementation of hydrogen fuel systems in such cases can lead to significant decreases in carbon emissions and enable global efforts to combat climate change.

China, South Korea, and Japan are some of the most developed countries that are rapidly increasing their investments in Fuel Cell Electric Vehicles (FCEV) as the terms supplied by the

government are indicating towards the need of hydrogen-driven transport. This trend is driven by the necessity to decrease dependence on fossil fuels, increase energy security and economic growth through the development of hydrogen infrastructure, and other emerging technologies.

It might be a more viable proposition for India in view of the country's high dependency on oil and high hydrocarbons fuel taxation. But there could be bottlenecks in the early years due to higher capital expenditures, inadequate manufacturing scale and lack of supporting infrastructure. Those long-distance trucks can eventually be fuel-cell electric vehicles (FCEVs) or hydrogen ICE (H2-ICE) in the future as the refueling infrastructure is built, because of their higher payloads and shorter refueling times than BEV, the other low-carb tech, even though BEVs are more efficient than hydrogen technologies. Plus, since BEVs won't decarbonize transportation until the grid is green, FCEVs promise to have a bigger impact on emissions.

The pilot project plan could revolutionize the transportation industry by integrating cutting-edge hydrogen technologies

In February 2024, the Ministry of New & Renewable Energy (MNRE) released the guidelines for pilot projects that will use green hydrogen in the transport sector. This is in response to the National [Green Hydrogen](#) Mission (NGHM). The Ministry of Road Transport and Highways (MoRTH) and the designated Scheme Implementing Agencies (SIAs) will manage these pilot projects.

The entire budgetary expenditure for the scheme through the fiscal year 2025–2026 is INR496 crore. It seeks to facilitate the development of refueling infrastructure as well as the integration of hydrogen technology into buses, trucks, and four-wheelers based on FCEV and H2-ICE technologies.

The initiative represents a significant advancement toward integrating hydrogen into the mobility sector in India. This will create an enabling environment for hydrogen projects in the transportation sector, along with other incentive programs mentioned in NGHM. While the future of hydrogen based mobility in India looks bright, the key will be on building infrastructure that will fill up gaps in the ecosystem and provide the enabling viability gap funding in initial phases. We need to work together being government, energy companies, think tanks, OEMs, etc to successfully build the hydrogen mobility framework.