

Renewable hydrogen supply: lowest-cost estimate for hydrogen delivery pathways for transportation fuel

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Renewable H₂ as a transportation fuel offers significant advantages over petroleum-derived fuels such as no air pollution, similar performance capabilities to petrol and diesel cars, as well as fast refueling. Despite several advantages, the development of cost-effective H₂ delivery infrastructure is the major hurdle in its commercialization. Furthermore, H₂ production from electrolysis requires high capital investment and therefore, cost-effective H₂ delivery system become more critically important in determining the economic feasibility of H₂ as a fuel.

Based on the above challenges, this study focusses on determining the lowest-cost H₂ delivery mode to end-user by considering compressed gas trucks, cryogenic liquid trucks, pipelines, and liquid organic hydrogen carrier (LOHC). For the distance of 100 km from the H₂ production facility to dispensing station, H₂ delivery via LOHC trailer is the most cost-effective option with a delivery cost of 1.35 \$/kg. H₂ delivery via pipelines is the most expensive with the delivery cost of 5.80 \$/kg.