Revolutionizing Mobility: Decoding Electric Vehicles (EVs) and Hydrogen Fuel Cell Vehicles (HFCVs)

Authors : Samarjeet Singh, Shubhank Arya, Shubham Chauhan

Abstract : In recent years, the rise in carbon emissions and the widespread effects of global warming have brought new energy vehicles into the spotlight. Electric vehicles (EVs) and hydrogen fuel cell vehicles (HFCVs), both producing zero tailpipe emissions, are seen as promising alternatives. This paper examines the working, structural characteristics, and safety designs of EVs and HFCVs, comparing their carbon emissions, charging infrastructure, energy efficiency, and safety features. The analysis reveals that both EVs and HFCVs significantly reduce carbon emissions and enhance safety compared to traditional vehicles, with EVs showing greater emission reductions. Moreover, EVs are advancing more rapidly in terms of charging infrastructure compared to hydrogen energy vehicles. However, HFCVs exhibit lower energy efficiency than EVs. In terms of safety, both types surpass conventional vehicles, though EVs are more prone to overheating and fire hazards due to battery design issues. Current research suggests that EV technology and its supporting infrastructure are more comprehensive, cost-effective, and efficient in reducing carbon emissions. With continued investment in the development of new energy vehicles and potential advancements in hydrogen energy production, the future for HFCVs appears promising. The paper also expresses optimism for innovative solutions that could accelerate the growth of hydrogen energy vehicles.

Keywords : electric vehicles, fuel cell electric vehicles, automotive engineering, energy transition
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