

ABSTRACT

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Hydrogen fuel is gaining attention as a potential alternative to fossil fuels due to its clean-burning properties and potential to reduce greenhouse gas emissions.

Our project “IMPLEMENTING HYDROGEN AS AN ALTERNATIVE ENERGY SOURCE IN ENGINE” offers a comprehensive examination of hydrogen's potential as a fuel for combustion engines, addressing its properties, combustion characteristics, engine performance, emissions, and overall feasibility. One of the primary needs for hydrogen fuel is its efficiency and sustainable production methods such as “ELECTROLYSIS”. Hydrogen, with its high energy density and clean combustion process, emerges as a promising alternative to conventional fossil fuels. Despite challenges in storage and distribution, hydrogen's properties make it an attractive option for addressing environmental concerns and advancing sustainable transportation. The study delves into hydrogen's key properties, emphasizing its high energy content per unit mass and clean combustion process that yields water vapor as the primary emission. However, challenges exist in storage and distribution due to hydrogen's low energy density by volume, necessitating high-pressure tanks or cryogenic storage. Infrastructure development for widespread hydrogen distribution requires substantial investment and technological advancements. In conclusion, while challenges persist in storage, distribution, and infrastructure development, hydrogen presents significant advantages as a fuel for combustion engines.

As an outcome of this project, hydrogen, a clean burning fuel has proved to be **environmental friendly** besides being **efficient** better than conventional gasoline or diesel engines. The Bharat Stage I (BS-I) introduced in 2000 and Bharat Stage VI (BS-VI) introduced in 2020, as per emission standards, the engines do not suit because of emitting pollution using gasoline engine hence hydrogen could prove to be the best alternative in future.