

Fuel Cell

Railways are working on an ambitious project of using fuel cell in locomotives. The fuel-cell-hybrid locomotive combines the environmental advantages of an electric locomotive with the lower infrastructure costs of a diesel-electric locomotive. Its energy source is hydrogen, which can be produced from various renewable energy and thus does not depend on imported oil. Depending on the primary energy source, it can be a totally zero-emissions locomotive. At present, based on real world utilization of the fuel-cell hybrid locomotive, use of PEM (proton exchange membrane) based hydrogen fuel-cells in the harsh rail environment has technically been proven.

Fuel cell locomotives are expected to be slightly more energy efficient than diesel locomotives, and because its fuel infrastructure will be homologous to that of a diesel, it should have similar fuel infrastructure costs.

Indian Railways plans to manufacture a 300 kW (with transient power well in excess of 1 MW) fuel cell based hybrid locomotive. The hybrid locomotive will be the heaviest and most powerful fuel cell locomotive manufactured yet. The manufacturing work shall be done by DMW/Patiala.

Under frame of new WDM3D locomotives shall be used as the platform for the fuel cell-hybrid locomotive. The fuel cell power plant shall be imported from a leading international supplier. Lead acid battery system and roof mounted lightweight compressed hydrogen storage system shall be taken from indigenous supplier.