

India's First Hydrogen Train

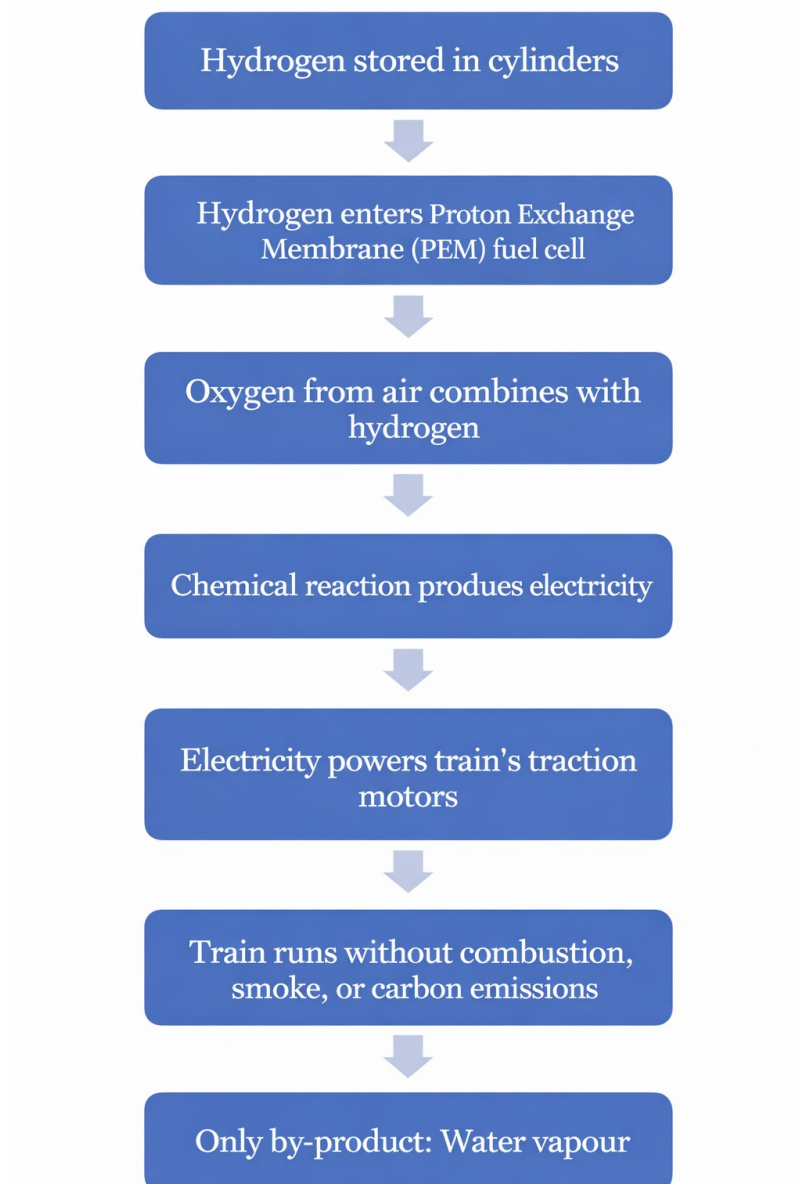
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Why in News?

Recently, Prime Minister flagged off India's 1st hydrogen-powered train between Jind and Sonipat (Haryana), marking India's entry into the select group of countries operating hydrogen trains.

Key Highlights

- **Technology** - Powered by **hydrogen fuel cell technology**
- **Process**



- **Power System** - Two hydrogen driving cars, each producing 1,200 kW, supported by lithium iron phosphate batteries and hydrogen storage cylinders.
- **Refuelling** - India's 1st integrated hydrogen railway ecosystem at Jind.
- It includes facilities for hydrogen production by electrolysis, plus storage, compression, and refuelling at the same plant.
- **Train specs** - 10 coaches, capacity 2,600 passengers; operational speed 75 kmph (designed for 110 kmph).
- **Global context** - Germany pioneer; China operational; France, Italy rolling out; Japan, US, UK, South Korea at pilot stage.
- India's train is **longest hydrogen train (10 coaches)** and among the **most powerful (3,200 HP)** globally.

Challenges

- **High costs** - Green hydrogen production, storage, refuelling

infrastructure expensive.

- **Safety** - Hydrogen highly flammable; requires high-pressure storage, strict protocols.
- **Infrastructure needs** - Reliable supply chain, trained manpower, dedicated maintenance facilities.

Reference

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