

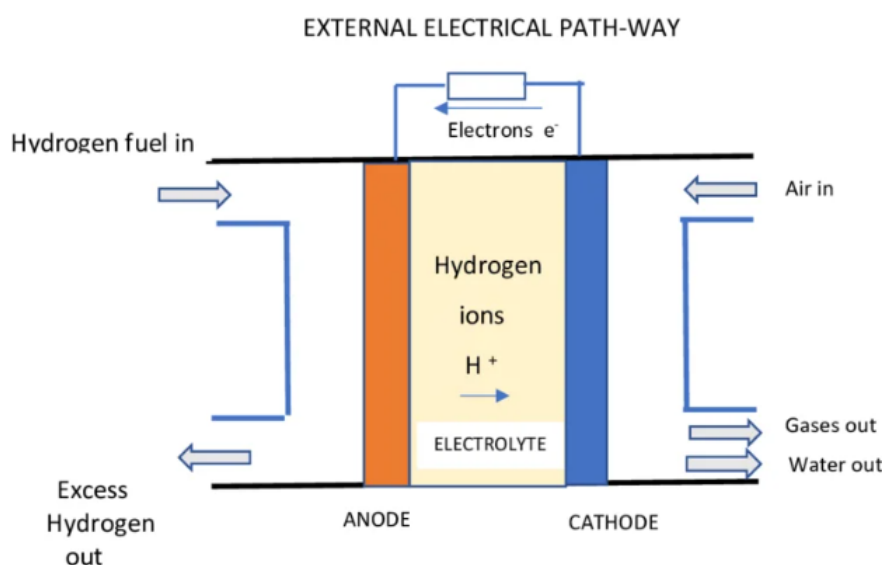
## India's First Indigenous Hydrogen Train

**Prelims:** Current events of national and international importance | Science and technology

### Why in News?

Recently, the Indian Railways has approved the introduction of a 10-car Hydrogen Fuel Cell-based trainset.

- **Route** - The country's first hydrogen-powered train will run *between Jind and Sonipat in Haryana*.
- **Developed by** - Chennai-based Integral Coach Factory (ICF).
- **Hydrogen fuel cell technology** - It generates electricity through a chemical reaction using hydrogen, with *water vapour as the only emission*.



- **Alternative to fossil fuel** - Hydrogen fuel cell technology, making it a clean alternative to conventional fossil fuel-based traction systems.
- Decarbonisation of the railways is a significant step towards attaining the net-zero goal by 2070.
- **Hydrogen for Heritage** - Indian Railways under "*Hydrogen for Heritage*" envisages deploying 35 hydrogen-powered trains on heritage and hill routes across the country.

### Features of India's hydrogen train system

- **Capacity** - 10-Car Train with 1200 KW Engine.
- **Maximum speed** - It will operate at a Maximum Speed of 75 kmph.
- **Hydrogen storage** - An *indigenous hydrogen storage* and refuelling facility has been set up at Jind for the train set.
- **License for hydrogen** - The Petroleum and Explosives Safety Organisation (PESO) has granted the required licence for storage and dispensing of compressed hydrogen gas at the site.
- **Hydrogen compression system** - It has been provided for refuelling operations, along with necessary technical support and critical spares to ensure reliable and fail-safe functioning.
- Provision of a standby compressor unit is also being ensured.
- **Safety protocols** - Necessary safety provisions, regular audits and standard operating procedures are being ensured for the proposed maintenance facility at Shakurbasti.
- Comprehensive safety and operational protocols, including
  - 24x7 monitoring of the hydrogen refuelling system,
  - Deployment of trained and certified personnel for critical operations, and
  - Regular inspection and maintenance schedules.
  - Various safety sensors, including hydrogen leak detectors and flame detectors, are installed at the hydrogen production.
- Operation and maintenance manuals for the hydrogen train-set and hydrogen plant, duly approved by RDSO (Research Designs and Standards Organisation), are also being made available.

## Reference

[PIB| Hydrogen Fuel Cell Train](#)

