



Hydrogen Fuel Cell Based Bus and Car Project

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Why in News

Recently, **National Thermal Power Corporation (NTPC) Limited** has announced the launch of its new project involving **hydrogen Fuel Cell Electric Vehicles** (FCEV) to run in Delhi and Leh.

Key Points

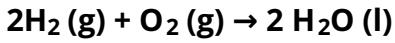
- NTPC Limited has **invited Global Expression of Interest** (EoI) to provide 10 Hydrogen **Fuel Cell** (FC) based buses and an equal number of such cars in Leh and Delhi.
The EoI has been issued by NTPC's wholly owned subsidiary, **NTPC Vidyut Vyapar Nigam (NVVN) Limited**.
- This will be the **first time such a project will be undertaken in India**, wherein a complete solution from **green energy** to fuel cell vehicle would be developed.
 - The move **aims at decarbonizing the mobility segment**.
 - **Tata Motors** launched Starbus Electric 9m, Starbus Electric 12m and the Starbus Hybrid 12m range of buses which are **made in India** and are **powered by alternative fuels (like Biofuels)**.
These buses produce **only water and heat as a byproduct**, thus, producing **zero emissions**.
- The initiative has been undertaken with the **support of the Ministry of New and Renewable Energy**.
The ministry will **also harness renewable energy for the generation of hydrogen and develop its storage and dispensation facilities** as part of pilot projects at Leh and Delhi.

- NTPS's initiatives for **complete e-mobility solutions for public transport** include:
 - **Creation of public charging infrastructure:** 90 public charging stations in various cities and battery charging and swapping stations for electric 3-wheelers have been commissioned.
 - **Providing electric buses to state/city transport undertakings.** For example, e-bus solutions for Andaman & Nicobar Administration are under implementation.
- **Other Initiatives:**
 The Government of India launched the **FAME India Scheme** with the **objective to support hybrid/electric vehicles market development and manufacturing ecosystem.**

Fuel Cell Electric Vehicle

Mechanism: The FCEV combines hydrogen and oxygen to generate an electric current.

Hydrogen + Oxygen = Electricity + Water Vapour



- FCEV engines are **similar to the conventional internal combustion engines** because they also rely on a constant supply of fuel (hydrogen) and oxygen. However, there are **no moving parts** in the fuel cell, so they are **more efficient and reliable.**
- **Advantages:**
 - FCEVs produce much **smaller quantities of greenhouse gases** (GHGs) and none of the air pollutants that cause health problems.
 - Fuel cells **emit only heat and water as a byproduct** and are far **more energy-efficient** than traditional combustion technologies.
 - FCEVs **do not need to be plugged in for charging**, like battery-powered EVs.
 - There is a **wide availability of resources for producing hydrogen.**
- **Disadvantages:**
 - The **process of making hydrogen needs energy**, often from fossil fuel sources, which raises questions over hydrogen's green credentials.
 - **Handling of hydrogen is a safety concern** because it is **more explosive** than petrol.
 - These vehicles are **expensive** and **fuel dispensing pumps are scarce.**

Source: PIB