Hydrogen Fuel

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Why is in news? Intracity Hydrogen Buses to start Operation in Leh on Trial Basis

Towards achieving Carbon-Neutral Ladakh, NTPC is setting up Hydrogen Fuelling Station, Solar Plant and providing five Fuel Cell buses for operation on intracity routes of Leh.

The first hydrogen bus reached Leh on 17th August, 2023 as part of a 3-month-long process of field trials, roadworthiness tests and other statutory procedures. This will be **India's first ever deployment of hydrogen buses on public roads**.

The **first-of-its-kind Green Hydrogen Mobility Project** at 11,562 ft is co-located with dedicated Solar plant of 1.7 MW for providing renewable power.

A unique feature of this project is that the **fuel cell buses are designed for operation in sub-zero temperatures** in rarefied atmosphere, which is typical for high altitude locations

NTPC is committed to achieve 60 GW of Renewable Energy capacity by 2032 and be a major player in Green Hydrogen Technology and Energy Storage domain.

The company is taking up **several initiatives towards decarbonization** such as Hydrogen blending, Carbon Capture, EV buses and Smart NTPC Townships.

Advantages of Hydrogen Fuel Cell:

The primary advantage of hydrogen fuel cell electric vehicles (FCEV) is that they **produce no tailpipe emissions**. They **only emit water vapour and warm air**.

Another advantage is that they are **more efficient than internal combustion engine vehicles**.

Even with the **fastest charging technologies**, it could take hours to charge a battery-powered electric bus. Meanwhile, hydrogen can be refilled in a fuel cell vehicle in a matter of minutes, nearly as fast as an internal combustion engine can be refilled with fossil fuels.

Other benefits include **increasing energy resiliency** through diversity and strengthening the economy.

Hydrogen Fuel:

Hydrogen fuel is a **zero-emission fuel burned with oxygen**.

It can be used in fuel cells or internal combustion engines.

It is also used as a fuel for spacecraft propulsion.

It can be manufactured by **Electrolysis of water** by using direct current, Natural Gas Reforming/Gasification, Fermentation.

National Hydrogen Energy Mission:

The Union Budget for 2021-22 announced a National Hydrogen Energy Mission (NHM) to draw up a road map for using hydrogen as an energy source.

It will capitalise on **one of the most abundant elements on earth** (Hydrogen) for a cleaner alternative fuel option.

The initiative has the **potential of transforming transportation**.

It will:

Focus on generation of hydrogen from green power resources.

Link India's growing renewable capacity with the hydrogen economy.

The usage of hydrogen will not only help India in achieving its emission goals under the Paris Agreement, but will also reduce import dependency on fossil fuels.