Promotion of Green Fuel

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Source: *PIB, NASA*

Background

Government of India has notified the **National Policy on Biofuels 2018** which inter-alia envisages **increased usage of biofuels in the energy and transportation sectors** of the country. The **policy aims to utilize, develop and promote domestic feedstock and its utilization for production of biofuels thereby increasingly substituting fossil fuels.** National Policy on Biofuels 2018 envisages an indicative target of **20% blending of ethanol in petrol and 5% blending of biodiesel in diesel by 2030.**

What is Green Fuel?

Green fuel, also known as biofuel, **is a type of fuel distilled from plants and animal materials**, believed by some to be more environmentally friendly than the widely-used fossil fuels that power most of the world.

Green Propellant by ISRO

- ISRO is developing **green propellants for use in future rocket & satellite propulsion systems**.
- ISRO has made a beginning by developing an **eco-friendly solid propellant based on Glycidyl Azide Polymer (GAP) as fuel** and Ammonium Di-Nitramide (ADN) as oxidizer at the laboratory level, which will eliminate the emission of chlorinated exhaust products from rocket motors.
- In addition, ISRO is also carrying out various **technology demonstration projects involving green propellant combinations such as Hydrogen Peroxide (H2O2), Kerosene, Liquid Oxygen (LOX), Liquid Methane, ADN-Methanol-water, ADN-Glycerol-water** etc.

- ISRO has already begun the move towards environment-friendly and green propellants with the acceptance of **Liquid Oxygen** (LOX)/Liquid Hydrogen (LH2) and LOX/Kerosene based propulsion systems for launch vehicles, and use of electric propulsion for spacecraft.
- **The LOX/LH2 combination is already being used in the cryogenic upper stages of GSLV and GSLV Mk-III launch vehicles.**
- ISRO has successfully developed **ISROSENE**, which is **a rocket grade version of kerosene** as an **alternative to conventional hydrazine rocket fuel.**

NASA's Green Propellant Infusion Mission

• The mission demonstrated the **exceptional features of a high-performance "green" fuel developed by the Air Force Research Laboratory (AFRL)** at Edwards Air Force Base in California.

• **The propellant blends hydroxyl ammonium nitrate with an oxidizer** that allows it to burn, creating an alternative to hydrazine, the highly toxic fuel commonly used by spacecraft today.

• NASA's Green Propellant Infusion Mission (GPIM) demonstrates a "green" alternative to conventional chemical propulsion systems for future spacecraft.

• The technology demonstration **mission seeks to improve overall propellant efficiency while reducing the handling concerns associated with the toxic fuel hydrazine.**

• GPIM also strives to optimize the performance of new hardware, systems and power solutions while ensuring the best value for investment and the safest space missions possible.

• GPIM launched to low-Earth orbit on June 25, 2019, aboard a SpaceX Falcon Heavy rocket. The mission is led by Ball Aerospace for NASA.