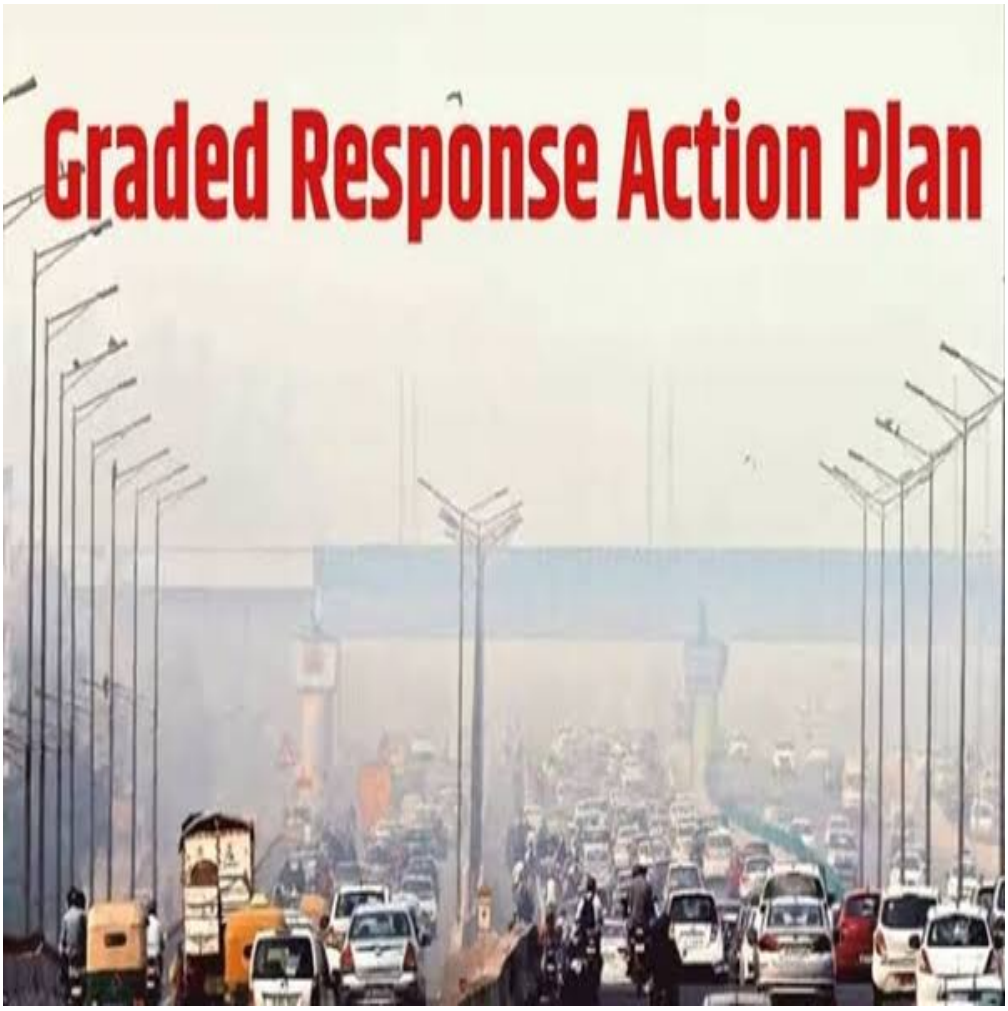
New Solid-State Fuel Storage Material by IISER

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

Why in news?

Scientists at the Indian Institute of Science Education and Research, Thiruvananthapuram, have developed a chemical compound that releases hydrogen and methane when heated moderately.

- **New material** – A novel solid-state organometallic compound contains magnesium, zinc, hydrogen, and carbon – ***Magnesium hydridomethylzincate*** that can store and release two important fuel gases - hydrogen and methane.
- **Working** – When the compound was heated in solution to 100° C, it released hydrogen — and when its crystals were heated in the absence of a solvent, at 80-110° C, it released both hydrogen and methane.
- **Potential application** – Since magnesium hydridomethylzincate is a *solid at room temperature*, it could offer an alternative to transporting methane and hydrogen as compressed gases.
- This, together with the relatively low temperature required to liberate the gases, merits more research on the compound.
- **Hydrogen, emerging fuel** – Both in India and around the world, hydrogen is emerging as an important new fuel because its combustion does not directly release carbon dioxide.
- **Difficult to store & transport** – However, because of its very low density, hydrogen is very difficult to store and transport and demands the use of expensive technologies.
- **Need for better fuel storage** – Current methods often rely on
    - Compressed gas storage
    - Specialized infrastructure
    - High transportation costs
- A solid material capable of storing and releasing fuel gases could provide a safer and more efficient alternative.
- **Significance** – The organometallic compounds could potentially provide molecular platforms for the storage and controlled release of fuel gases.
- **Limitation** – The compound is highly sensitive to moisture, and it is not known whether it can be 'replenished' once its gaseous contents have been depleted.



Reference

[The Hindu | IISER researchers make solid material that releases two fuel gases]