Green Ammonia

Prelims: *Current events of national and international importance | Environment*

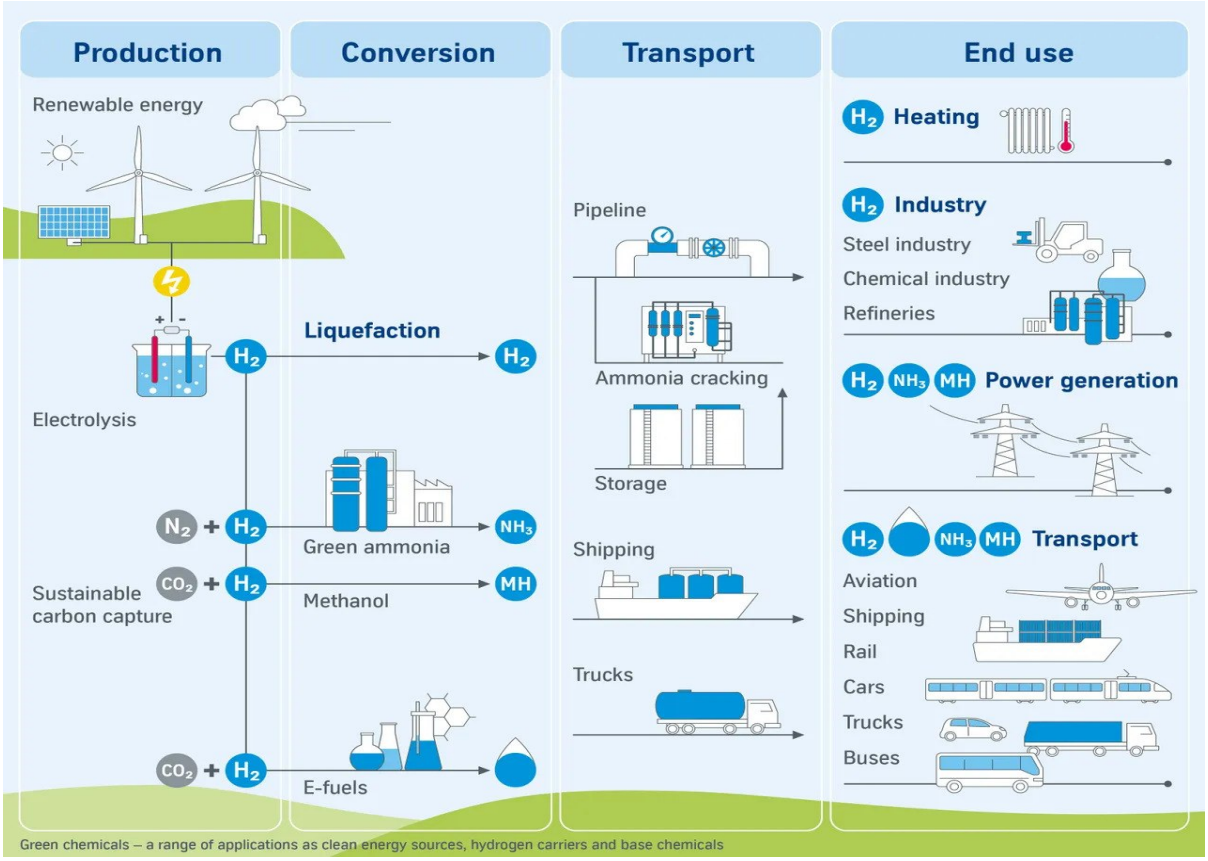
Why in News?

India signed green ammonia supply agreements between industry, SECI and fertiliser companies under the National Green Hydrogen Mission.

- **Ammonia** – Ammonia is a *pungent gas* that is widely used to make agricultural fertilisers.
- **Green Ammonia –** An Ammonia (NH_3) produced using renewable energy (solar, wind, hydro) to generate green hydrogen *via electrolysis*, which is then combined with nitrogen, making ammonia is *100% renewable and carbon-free*.
- **Production process**
  - **Make Hydrogen** – Use electricity from solar panels or wind turbines to split water in a machine called an electrolyser.
  - This gives hydrogen gas, and the leftover oxygen is released into the air.
  - **Get Nitrogen** – Pull nitrogen directly out of the air (since air is mostly nitrogen) using filters or cooling machines.
  - **Combine Them** – Put hydrogen and nitrogen together in a high-pressure chamber with a catalyst, and they bond to form ammonia (NH_3).
- **Other Types of Ammonia**

Grey Ammonia	Fossil fuel-based, high emissions.
Blue Ammonia	Fossil fuel-based with carbon capture.
Green Ammonia	Renewable-based, zero carbon emissions.

- **Applications**
  - Fertiliser production (urea, ammonium nitrate).
  - Shipping fuel (zero-carbon alternative).
  - Power generation (co-firing or direct combustion).
  - Hydrogen carrier (transport and storage of green hydrogen).



India’s Green Ammonia Push

- **National Green Hydrogen Mission (NGHM)** – Targeting 5 MMT of green hydrogen annually by 2030.
- **SIGHT Program** – Strategic Interventions for Green Hydrogen Transition, which provides financial incentives for electrolyser manufacturing & green hydrogen production.
- **Global Competitiveness** – India’s cost advantage makes it a potential exporter of green ammonia.
- **Largest Tender Globally** – India signed long-term agreements for 724,000 tonnes per year of green ammonia supply to fertiliser units.
- **Price Advantage** – Indian discovered prices range Rs. 49.75–64.74/kg, *far below global benchmarks (~Rs. 110/kg).*
- **Economic Impact** – Forex *savings of $2.5 billion* over 10 years by replacing imports.
- **Significance –** Enhance India’s energy security by reducing imports, positioning the country as a global leader in hydrogen derivatives, while directly aligning with India’s Net Zero 2070 target.

References

1. PIB | Green Ammonia
2. Norton Rose | Green Ammonia



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