Green Hydrogen

What is Hydrogen

- Hydrogen is the lightest chemical element.
- Hydrogen is colorless, odorless, tasteless, non-toxic, and highly flammable.
- Hydrogen is the third most abundant element in the human body, the two most abundant elements in the human body are oxygen and carbon.
- Hydrogen is the most abundant chemical substance in the universe, accounting for about 75% of all normal matter.
- Hydrogen can be produced from many resources including fossil fuels, nuclear power, biomass, and renewable energy sources.

Types of Hydrogen

There are the following types of hydrogen-

1. Blue Hydrogen
2. Grey Hydrogen
3. Green Hydrogen

What is Green Hydrogen

Green hydrogen is produced by using clean energy from additional renewable energy sources, such as solar or wind power, to split water into two hydrogen atoms and one oxygen atom through a process called electrolysis.

India's green hydrogen production target with respect to Other Countries:

- In August 2021, Prime Minister Narendra Modi announced the National Hydrogen Mission as a step towards environmental protection and making India a global hub for the production and export of green hydrogen.
- India plans to produce 5 million tonnes of green hydrogen per year by 2030, which is half of the EU's 2030 target of 10 million tonnes. On the other hand, China aims to produce 2,00,000 tonnes of green hydrogen per year by 2025. Spain, Germany, and France have also announced their commitment to installing 4 GW, 5GW, and 6.5 GW of green hydrogen respectively by 2030.

Present potential of Green Hydrogen in India:

There are 26 hydrogen projects in operation in India with a total capacity of 255,000 tonnes per annum, however, most of these announced projects are still in their initial stages.

Challenges associated with Green Hydrogen

Technical issue:

Electrolysis is the process of using electricity to split water into hydrogen and oxygen. By running an electric current through the water, the membrane and electrolyte can separate the water into hydrogen and oxygen.

Transport and Storage:

The production of green hydrogen requires either very high pressures or very high temperatures, both with their own technical difficulties.

Electricity:

A huge amount of electricity is required to make green hydrogen.