

1. The iron and steel manufacturing sectors can rely on lightest element to reach net zero goals. discuss?

To achieve net zero emissions by 2070 and phase down coal, the iron and steel manufacturing sectors can rely on green hydrogen.

Green hydrogen :-

Green hydrogen is generated by renewable energy, in which water is split into hydrogen.

Iron and steel manufacturing sectors

→ Iron sectors emits 9% of total GHG in the environment.

→ These sectors rely on coal and thereby import of coking coal worth \$ 8-10 billion is required.

→ To reduce coal dependency, green hydrogen is the best alternative. It has various advantages and comes with some disadvantages as well.

Issues with green hydrogen in steel sector

→ Green steel is very costly compared to steel produced by coal.

→ Generation of renewable energy and the destination of steel sector are fairly located.

→ Ensuring continuous renewable energy generation is difficult due to climate

changes.

→ However for every problem there is an solution.

### Four fold solution

→ Firstly, use of rotary kiln that is producing iron without melting ore rather than blast furnace. Thereby the emissions is lowered.

→ Secondly, Capacities for blending green hydrogen should be kept ready for transition, going with blast furnace will not work as it ~~is~~ not viable. But Natural gas based shaft furnace are hydrogen ready and operate with blend of natural gas and green hydrogen.

Thirdly, to make green steel economically viable, blending green hydrogen with grey hydrogen and grid energy with renewable power will be the best solution.

Finally, market for <sup>green</sup> steel must be ready. Government's infrastructure initiatives like Gathi Sakthi, Jal Jeevan mission, Bharatmala, Pradhan Mantri Awas Yojana can require steel thereby can use green steel and promote less emissions.

Thus iron and steel manufacturing sectors can rely on lightest element to reach net zero goals.