



Green Steel

For Prelims: Green Steel, National Hydrogen Energy Mission (NHM), Steel Scrap Recycling Policy, PAT Scheme, CCUS Initiative, India's Commitments at the Conference of the Parties (COP26).

For Mains: Green Steel, Significance, Challenge and the Solution.

Why in News?

Ministry of Steel seeks to reduce carbon emissions in steel industry through promotion of [Green Steel](#).

What is Green Steel?

▪ About:

- Green Steel is the **manufacturing of [steel](#) without the use of fossil fuels**.
 - This can be done by using **low-carbon energy sources such as hydrogen, coal gasification, or electricity** instead of the traditional carbon-intensive manufacturing route of coal-fired plants.
- It eventually **lowers [greenhouse gas emissions](#), cuts cost and improves the quality of steel**.
- **[Low-carbon hydrogen \(blue hydrogen and green hydrogen\)](#)** can help **reduce the steel industry's carbon footprint**.

▪ Ways of Production:

- **Substituting the Primary Production Processes with Cleaner Alternatives:**
 - **[Carbon capture, utilization and storage \(CCUS\)](#)**.
 - Replacing conventional sources of energy with low-carbon hydrogen.
 - Direct electrification through electrolysis of iron ore.

▪ Significance:

- The steel industry is the largest industrial sector in terms of intensive energy and resource use. It is **one of the biggest emitters of carbon dioxide (CO₂)**.
- In view of commitments made at the **[Conference of the Parties \(COP26\)](#)** climate change conference, the Indian steel industry **needs to reduce its emissions substantially by 2030 and hit net-zero carbon emissions by 2070**.

What is the Status of Steel Production in India?

- **Production:** India is currently the **world's 2nd largest producer of crude steel**, producing 120 Million Tonnes (MT) crude steel during financial year 2021- 2022.
- **Reserves: More than 80% of the country's reserves** are in the states of Odisha, Jharkhand, West Bengal, Chhattisgarh and the northern regions of Andhra Pradesh.
 - **Important steel-producing centers are** Bhilai (Chhattisgarh), Durgapur (West Bengal), Burnpur (West Bengal), Jamshedpur (Jharkhand), Rourkela (Odisha), Bokaro (Jharkhand).
- **Consumption:** India is the **2nd largest consumer of finished steel** in 2021 (106.23 MT), preceded by China as the largest steel consumer as per World Steel Association.

What are the Related Government Initiatives?

- **Steel Scrap Recycling Policy, 2019:**
 - [Steel Scrap Recycling Policy, 2019](#) enhances the availability of domestically generated scrap to reduce the consumption of coal in steel making.
- **National Green Hydrogen Mission:**
 - Ministry of New and Renewable Energy (MNRE) has announced [National Green Hydrogen Mission](#) for green hydrogen production and usage. The steel sector has also been made a stakeholder in the Mission.
- **Motor Vehicles (Registration and Functions of Vehicles Scrapping Facility) Rules September 2021:**
 - It shall increase availability of scrap in the steel sector.
- **National Solar Mission:**
 - Launched by MNRE in January 2010, it promotes the use of solar energy and also helps reduce the emission of steel industry.
- **Perform, Achieve and Trade (PAT) Scheme:**
 - [PAT Scheme](#) incentivizes steel industry to reduce energy consumption.
- **NEDO Model Projects:**
 - [Japan's New Energy and Industrial Technology Development Organization \(NEDO\) Model Projects](#) have been implemented in steel plants for Energy Efficiency Improvement.

UPSC Civil Services Examination Previous Year Questions (PYQs)

Prelims

Q. Which of the following are some important pollutants released by steel industry in India? (2014)

1. Oxides of sulphur
2. Oxides of nitrogen
3. Carbon monoxide
4. Carbon dioxide

Select the correct answer using the code given below:

- (a) 1, 3 and 4 only
(b) 2 and 3 only
(c) 1 and 4 only
(d) 1, 2, 3 and 4

Ans: (d)

Exp:

- Steel industry creates pollution as it uses coal and Iron ore whose combustion releases various Polycyclic Aromatic Hydrocarbons (PAH) compounds and oxides into the air.
- In steel furnace, coke reacts with iron ore, releasing iron and generating major environmental pollutants.
- The pollutants released from steel producing units are:
 - Carbon Monoxide (CO), hence, 3 is correct.
 - Carbon Dioxide (CO₂), hence, 4 is correct.
 - Oxides of Sulphur (SO_x), hence, 1 is correct.
 - Oxides of Nitrogen (NO_x), hence, 2 is correct.
 - PM 2.5,
 - Waste Water,

- Hazardous waste,
- Solid waste.
- However, technological interventions in the form of air filters, water filters and other water saving, power saving and closed container can reduce emissions.
- **Therefore, option (d) is the correct answer**

Mains

Q1. Account for the present location of iron and steel industries away from the source of raw material, by giving examples. **(2020)**

Q2. Account for the change in the spatial pattern of the Iron and Steel industry in the world. **(2014)**

Source: PIB

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