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DAILY CURRENT AFFAIRS

1. Green Steel and Decarbonisation of India's Steel Sector
2. Nicotine Pouches: Regulatory Gaps in India
3. India's Carbon Credit Scheme Gets U.K. Recognition
4. E-FAST India, an initiative of NITI Aayog, launches PACT to support accelerated zero-emission freight deployment in India
5. Can air-cooling handle the heat from a 1-GW data centre?

1. Green Steel and Decarbonisation of India's Steel Sector

Source: The Hindu

Why in News?

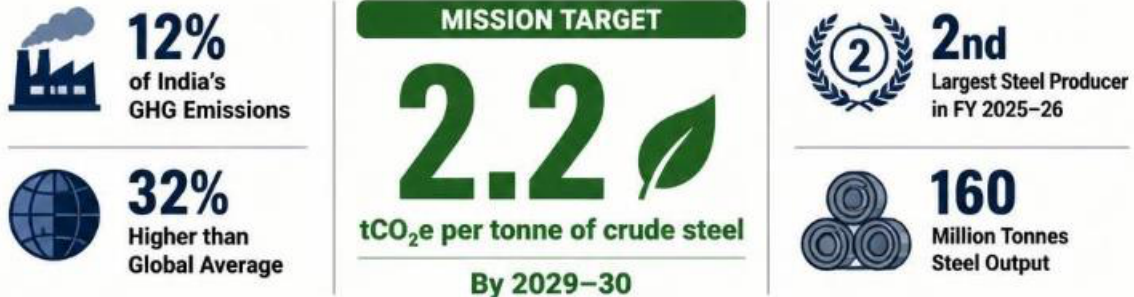
India is seeking to decarbonise its steel industry through a ₹5,000-crore scheme and the **National Mission on Green Steel**. The issue has gained importance as the sector faces pressure from rising domestic demand, high carbon intensity and the EU's **Carbon Border Adjustment Mechanism (CBAM)**.

Key Facts

- India is the **world's second-largest steel producer**, producing around 160 million tonnes in FY 2025–26.
- The steel sector contributes nearly **12% of India's total greenhouse gas emissions**.
- Its emissions intensity is around **32% higher than the global average**.
- The **National Mission on Green Steel** aims to bring emissions intensity down to **2.2 tonnes CO₂e per tonne of crude steel by 2029–30**.
- The conventional **Blast Furnace–Basic Oxygen Furnace (BF-BOF)** route accounts for about **43% of India's crude steel production**.
- Around **43 million tonnes per annum of blast-furnace capacity** is due for relining before 2030, creating a risk of long-term **carbon lock-in**.

NATIONAL MISSION ON GREEN STEEL

Decarbonising India's Steel Sector



How Can India Produce Green Steel?

- **Electric Arc Furnaces (EAFs):** Use electricity and steel scrap instead of coal-intensive blast furnaces.
- **Direct Reduced Iron (DRI):** Iron ore is reduced without melting it; the process can increasingly use **green hydrogen** instead of fossil fuels.
- **Green hydrogen:** Can replace coal/natural gas in parts of the steelmaking process.
- **Greater use of scrap:** Recycling steel through EAFs can substantially reduce energy use and emissions.
- **Renewable electricity:** Decarbonising electricity supply is essential for low-carbon EAF and hydrogen-based steel production.

The government is supporting pilot **green hydrogen projects**, while the ₹5,000-crore scheme seeks to accelerate technological transition and investment.

National Mission on Green Steel

The steel sector in India is currently at a critical turning point as the government scales up the **National Mission on Green Steel**. With India being the world's second-largest steel producer, this mission is vital for achieving the **Net Zero by 2070** target while meeting the growing infrastructure demand.

Key Objectives and Framework

Formally introduced through the **Green Steel Taxonomy** in December 2024, the mission aims to decarbonize one of the most "hard-to-abate" sectors. India is the **first nation globally** to release a formal national taxonomy for green steel.

- **Emission Target:** Reduce emission intensity from the current ~2.55 tCO₂/tfs (tonnes of CO₂ per tonne of finished steel) to **2.2 tCO₂/tfs by 2030**.
- **Funding:** The government is formulating an outlay of approximately **₹15,000 crore** to support green transition, including Production Linked Incentives (PLI) and concessional loans.
- **Graded Star Rating:** Steel is certified based on its "greenness percentage" compared to the 2.2 threshold:
 - **5-Star:** Intensity < 1.6 t-CO₂e/tfs
 - **4-Star:** Intensity 1.6 to 2.0 t-CO₂e/tfs
 - **3-Star:** Intensity 2.0 to 2.2 t-CO₂e/tfs

Role of the National Green Hydrogen Mission

The steel sector is a major stakeholder in the broader **National Green Hydrogen Mission**.

- **Pilot Projects:** The Ministry of Steel has awarded projects to test **100% hydrogen** in vertical shaft Direct Reduced Iron (DRI) plants and hydrogen injection in existing Blast Furnaces to reduce coal/coke consumption.
- **Budgetary Support:** Over **₹450 crore** has been allocated specifically for steel-related hydrogen pilot projects up to 2029-30.

Challenges and Way Forward

The major challenge is avoiding **carbon lock-in** from fresh investment in BF-BOF capacity and furnace relining. Redirecting investment towards **DRI-EAF, scrap-based production and green hydrogen** can reduce future emissions without necessarily requiring proportionately higher capital expenditure.

India must also address the competitiveness challenge created by **CBAM**, which places a carbon-related cost on certain imports into the European Union. Developing credible green-steel standards, carbon accounting, renewable power and hydrogen infrastructure can help Indian steel remain competitive in global markets.

Prelims Practice Question

Consider the following statements regarding Green Steel:

1. Green steel can be produced using Direct Reduced Iron technology powered by green hydrogen.
2. Electric Arc Furnaces can utilise steel scrap as a major input.
3. The Blast Furnace–Basic Oxygen Furnace route is generally less carbon-intensive than the EAF route.

Which of the statements given above is/are correct?

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

Answer: (a)

Mains Practice Question

“India’s steel sector faces the twin challenge of meeting rising demand while avoiding long-term carbon lock-in.” Discuss the technological and policy measures required for decarbonising India’s steel industry.

2.Nicotine Pouches: Regulatory Gaps in India

Source: The Hindu

Why in News?

A study by the ICMR–National Institute of Cancer Prevention and Research has highlighted the widespread availability of nicotine pouches in Indian cities, including through online platforms. The issue has raised concerns because these products do not clearly fall within the existing legal framework governing tobacco, drugs or electronic cigarettes.

What are Nicotine Pouches?

- Small, tobacco-free, tea-bag-like pouches placed inside the mouth to release nicotine.
- Unlike cigarettes or e-cigarettes, they involve neither combustion nor vapour.
- They can deliver significant amounts of nicotine and may create dependence.

- WHO warned in May 2026 about health risks associated with such emerging nicotine products.

Why is Regulation Difficult in India?

- **COTPA, 2003:** Primarily regulates tobacco products; nicotine pouches do not clearly fall within its definition because they contain nicotine but no tobacco.
- **Drugs and Cosmetics Act, 1940:** Covers nicotine patches and gums when marketed for therapeutic purposes, but nicotine pouches generally do not make such therapeutic claims.
- **PECA, 2019:** Prohibits electronic cigarettes; nicotine pouches are non-electronic and therefore fall outside its scope.
- **Food Safety and Standards Act:** There is an argument that their broad definition of "food" could potentially cover such products, creating another regulatory route.
- **Import regulation:** Nicotine pouches are classified as "restricted" goods under the Customs Act, 1962 and Foreign Trade (Development and Regulation) Act, 1992.
- Their availability in duty-free airport shops has further complicated the question of their legal status.

While nicotine pouches (often known by brands like **ZYN** or **Velo**) are marketed as "tobacco-free" because they use synthetic or extracted nicotine, Indian regulators have largely closed the loopholes that previously allowed them to operate in a "grey area."

- **CDSCO & DTAB Position:** The **Central Drugs Standard Control Organisation (CDSCO)** and the **Drugs Technical Advisory Board (DTAB)** have recently moved to block and reject license applications for nicotine pouches in various strengths (2mg, 4mg, 6mg). They classified these as **unapproved drug products** rather than general consumer goods.
- **The "Gateway" Concern:** The National Tobacco Control Programme (NTCP) has formally recommended against their sale, arguing that the flavored, discreet nature of the sachets targets teenagers and could lead to lifelong nicotine dependence.
- **Legal Precedent (Duty-Free Case):** A major legal battle recently emerged concerning the sale of nicotine pouches at **Mumbai International Airport's duty-free shops**. The government argued that even in customs-bonded warehouses, these products violate Indian drug laws, as nicotine is a "psychoactive and addictive chemical" that requires strict medicinal approval.

Legislative Framework

The regulation of nicotine pouches in India is governed by a patchwork of three primary laws:

Law/Regulation	Application to Nicotine Pouches
Drugs and Cosmetics Act, 1940	Regulates nicotine as a "drug." Only Nicotine Replacement Therapy (NRT) products like gums (< 2mg) are typically exempt from prescriptions.
COTPA, 2003	While COTPA targets tobacco leaf products, the government is increasingly interpreting "tobacco-free" nicotine as falling under its advertising and sale-to-minor bans.
PECA, 2019	The Prohibition of Electronic Cigarettes Act specifically bans vaping devices. While pouches don't use batteries, the government uses the <i>spirit</i> of this law to argue against all "new-age" nicotine products.

Way Forward

- Establish a clear, product-neutral regulatory framework covering emerging nicotine products.
- Strengthen coordination among DGFT, Customs, health authorities and food regulators.
- Use appropriate provisions under the Customs Act and foreign trade regulations to restrict import where justified on public-health grounds.
- Strengthen online monitoring to prevent unauthorised sale and marketing.
- Adopt a precautionary approach to products capable of creating nicotine dependence, especially among young people.

Prelims Practice

Q. Consider the following statements regarding nicotine pouches in India:

1. They contain tobacco and are designed to be smoked.
2. The Prohibition of Electronic Cigarettes Act, 2019 specifically regulates nicotine pouches.
3. Nicotine pouches are tobacco-free products that deliver nicotine orally.

Which of the statements given above is/are correct?

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

Answer: (c)

Mains Practice

Q. Nicotine pouches expose the limitations of India's fragmented regulatory framework for emerging nicotine products. Discuss the regulatory gaps and suggest measures to safeguard public health.

(10 marks, 150 words)

5.Can air-cooling handle the heat from a 1-GW data centre?

Source: The Hindu

Why in News?

The U.K. has officially recognised India's **Carbon Credit Trading Scheme (CCTS)** as a qualifying overseas carbon-pricing mechanism under its **Carbon Border Adjustment Mechanism (CBAM)**. This can provide pricing relief to Indian exporters by allowing carbon prices already paid under India's scheme to be considered while calculating the U.K. CBAM liability.

India's Carbon Credit Trading Scheme (CCTS)

- CCTS was notified on **28 June 2023** under the **Energy Conservation (Amendment) Act, 2022**.
- It aims to establish an **Indian carbon market**.
- Initially focuses on energy-intensive sectors such as:
 - Aluminium
 - Cement
 - Iron & steel
- It operates as a **compliance mechanism**, under which obligated entities are assigned greenhouse-gas emission-intensity targets.
- The **Bureau of Energy Efficiency (BEE)** under the Ministry of Power is involved in its implementation.

U.K. RECOGNISES INDIA'S CARBON MARKET

CCTS gets pricing relief under U.K. CBAM



WHAT IT MEANS



Indian exporters get carbon price relief under U.K. CBAM

KEY FACT



U.K. CBAM starts from 1 Jan 2027

SECTORS COVERED



Aluminium



Cement



Fertiliser



Hydrogen



Iron & Steel

— Initial sectors under U.K. CBAM —

HOW CBAM WORKS



EMBODIED EMISSIONS

—



QUALIFYING OVERSEAS CARBON PRICE (CCTS)

=



CBAM TAX PAYABLE

LEGAL BASIS



Included under Carbon Border Adjustment Mechanism (Calculation of CBAM Rate and Determination of Carbon Price Relief) Regulations 2026

U.K. CBAM and Significance for India

- The U.K. CBAM is scheduled to begin from **1 January 2027**.
- It seeks to prevent **carbon leakage** by imposing a carbon-related charge on carbon-intensive imports.
- Initially covered sectors include:
 - Aluminium
 - Cement
 - Fertiliser
 - Hydrogen
 - Iron & steel
- The U.K. CBAM calculates liability based on the **embodied emissions** of imported goods.

- Recognition of India's CCTS means carbon pricing already paid under a qualifying Indian mechanism can potentially receive **relief from the U.K. CBAM charge**.
- This could reduce the additional carbon-related financial burden on Indian exporters and improve their competitiveness in the U.K. market.

Carbon Credit Trading Scheme (CCTS)

The **Carbon Credit Trading Scheme (CCTS)** is India's first domestic compliance carbon market, designed to help the country meet its updated **Nationally Determined Contributions (NDCs)** under the Paris Agreement. Formally notified in June 2023, the scheme has rapidly transitioned into its operational phase as of **2026**, with the first compliance filings due in July 2026.

The Dual-Track Framework

The CCTS operates under the **Energy Conservation (Amendment) Act, 2022**, and is structured into two distinct tracks:

- **Compliance Mechanism:** Obligated entities (large industries) are given **Greenhouse Gas Emission Intensity (GEI)** targets. If they emit less than their target, they earn **Carbon Credit Certificates (CCCs)**; if they exceed it, they must buy CCCs to bridge the gap.
- **Offset Mechanism:** Non-obligated entities (e.g., renewable energy projects, reforestation, green hydrogen) can voluntarily generate CCCs by reducing or avoiding emissions, which can then be traded in the market.

Institutional Architecture

The scheme is a multi-ministry effort coordinated by five key bodies:

- **Administrator:** The **Bureau of Energy Efficiency (BEE)** designs the methodologies, recommends targets, and empanels verifiers.
- **Governance:** The **Ministry of Power** oversees the framework and notifies obligated entities.
- **Target Setting:** The **Ministry of Environment, Forest and Climate Change (MoEFCC)** notifies the specific GEI targets under the Environment (Protection) Act, 1986.
- **Registry:** The **Grid Controller of India** maintains the electronic registry for all CCCs.
- **Market Regulator:** The **Central Electricity Regulatory Commission (CERC)** regulates trading on power exchanges.

2026 Implementation Status

The scheme is no longer just a policy draft; it is now legally binding for industry.

- **First Compliance Cycle:** The first cycle (FY 2025-26) concluded in March 2026, with entities required to submit verified performance reports by **July 31, 2026**.
- **Sectors Covered:** Initially, nine energy-intensive sectors are covered, including **Aluminium, Cement, Chlor-alkali, Pulp & Paper, Fertiliser, Petroleum Refineries, Petrochemicals, and Textiles**. The **Iron and Steel** sector is the latest to be integrated with final targets being processed in mid-2026.
- **Trading Launch:** Trading of CCCs on domestic power exchanges is expected to commence around **October 2026** after the first set of compliance filings are processed.

By internalizing the cost of carbon, the CCTS creates a clear financial incentive for Indian industries to adopt green hydrogen, carbon capture, and renewable energy, ultimately steering the economy toward the **Net Zero 2070** goal.

Prelims Practice

Q. Consider the following statements regarding India's Carbon Credit Trading Scheme (CCTS):

1. It was notified under the Energy Conservation (Amendment) Act, 2022.
2. It seeks to establish India's domestic carbon market.
3. It initially covers energy-intensive sectors such as aluminium, cement and iron & steel.

Which of the statements given above are correct?

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

Answer: (d)

Mains Practice

Q. Recognition of India's Carbon Credit Trading Scheme by the U.K. can strengthen India's position in emerging global carbon markets. Discuss its significance for Indian exporters and the challenges associated with carbon border measures.

(10 marks, 150)

4.e-FAST India, an initiative of NITI Aayog, launches PACT to support accelerated zero-emission freight deployment in India

Source: PIB / NITI Aayog

PACT and Zero-Emission Freight

- NITI Aayog's e-FAST India initiative launched the **Platform for Aggregating Clean Transport (PACT)** at the 5th e-FAST India Summit 2026.
- PACT aims to aggregate freight demand from shippers, Logistics Service Providers (LSPs) and other stakeholders and convert it into deployment opportunities along identified freight corridors.

- It brings together shippers, LSPs, vehicle manufacturers, financiers, charge point operators and other ecosystem partners.
- The objective is to improve demand visibility, facilitate charging infrastructure planning and strengthen the commercial case for electric medium- and heavy-duty vehicles (e-MHDVs).

ZET Marketplace and Significance

- Alongside PACT, the **Zero Emission Truck (ZET) Marketplace** was launched to connect manufacturers, logistics companies, financiers, charging providers and technology firms.
- India's electric freight vehicle deployments increased more than fourfold, from 201 in FY25 to 826 in FY26, while more than 3,000 electric medium- and heavy-duty trucks are currently estimated to be operational.
- The initiative addresses major barriers to freight electrification, including fragmented demand, high financing costs and inadequate charging infrastructure.
- Demand aggregation can help create commercially viable projects and enable coordinated development of charging infrastructure along major freight corridors.

Significance for India

- Freight electrification can reduce dependence on fossil fuels, lower transport emissions and strengthen energy security.
- PACT represents a shift from isolated electric-truck pilots towards coordinated, corridor-based and commercially scalable deployment.
- It also supports India's broader clean-mobility transition and its long-term commitment towards net-zero emissions by 2070.

5.Can air-cooling handle the heat from a 1-GW data centre?

Source: The Hindu

Cooling Challenge in Large Data Centres

- A 1-GW data centre can generate nearly 1 GW of heat from its computing equipment, requiring continuous and efficient heat removal.
- Google's proposed 1-GW data centre in Visakhapatnam is reportedly planning to use air-cooling technology.

- Air-cooling uses fans and air-handling systems to remove heat from server racks. Common systems include Computer Room Air Conditioners (CRACs), Computer Room Air Handlers (CRAHs) and free-cooling systems.
- Air-cooling generally requires less water than water-intensive evaporative cooling and can have lower initial infrastructure costs.
- However, its effectiveness declines as server power density increases, particularly with modern AI chips.

Liquid Cooling and Emerging Technologies

- Direct liquid cooling, particularly Direct-to-Chip (DTC) cooling, transfers heat directly from processors using a liquid coolant, which has a much higher heat-transfer capacity than air.
- Immersion cooling involves placing electronic components in a non-conductive liquid and is suitable for very high-density computing environments.
- The practical “thermal wall” for conventional air-cooling is around 40 kW per rack, while modern AI racks can reach 120–150 kW.
- TCS’s proposed 1-GW HyperVault data centre plans to use liquid cooling, including DTC cooling, along with renewable energy.
- Hybrid cooling is increasingly relevant for large facilities, with air-cooling used for relatively low-density areas and liquid cooling for high-density AI clusters.

Water-Energy Trade-off in Data Centres

- Evaporative cooling can be energy-efficient in suitable climates but requires substantial quantities of water, creating concerns in water-stressed regions.
- Dry-cooling largely avoids water consumption but requires larger heat-exchange surfaces and can be less efficient in hot climates.
- The choice of cooling technology therefore involves a trade-off between energy efficiency, water consumption, cost and computing density.
- Google has committed to replenishing 120% of the water consumed for non-cooling purposes by 2030, with water benefits assessed through the Volumetric Water Benefit Accounting standard.
- Measures such as rainwater harvesting, groundwater recharge and water ATMs can help reduce the local water footprint of data-centre operations.