



## Rise of India's Carbon Marketplace

This editorial is based on "[Establishing a carbon market](#)" which was published in The Hindu on 29/08/2024. The article highlights India's transition from energy efficiency targets under the PAT scheme to establishing its own carbon market, balancing climate goals with its development priorities, particularly in hard-to-abate industries like iron and steel.

**For Prelims:** [Perform, Achieve, and Trade scheme](#), [Nationally Determined Contributions](#), Carbon Credits, Carbon Taxes, World Bank's State and Trends of Carbon Pricing 2024, [Carbon Credits Trading Scheme](#), [Electricity Conservation Act, 2001](#), [Bureau of Energy Efficiency](#), [International Monetary Fund](#), [Carbon footprint](#), [India's industrial sector](#), [Carbon Border Adjustment Mechanism](#), [World Economic Forum](#).  
**For Mains:** Current Government Initiatives Related to the Carbon Market in India, Advantages of Implementing a Carbon Tax, Major Challenges Related to Carbon Taxation in India.

As the **world's third-largest emitter**, India faces the dual challenge of meeting its climate objectives while sustaining its developmental aspirations. The recent announcement by the Finance Minister to shift "**hard to abate**" industries from energy efficiency targets to emission targets marks a pivotal change in policy. This shift recognizes the limitations of the existing [Perform, Achieve, and Trade \(PAT\) scheme](#), which has primarily focused on relative energy efficiency.

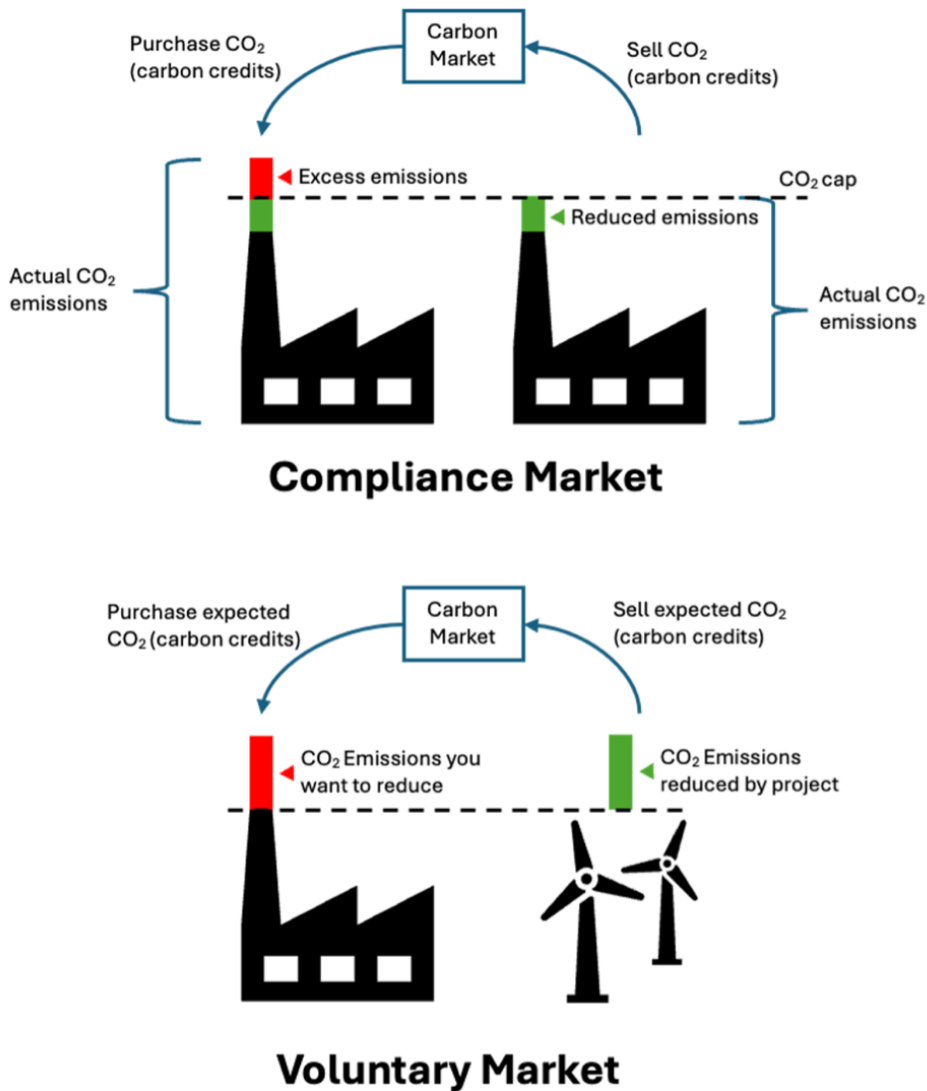
The move towards establishing an [Indian Carbon Market](#) offers a significant opportunity. Although India is not obligated to mandatory emission reductions under its [Nationally Determined Contributions \(NDCs\)](#), this step signals a strong commitment to exploring market-based solutions for curbing emissions. However, crafting a **carbon market** that effectively aligns with India's development priorities while ensuring substantial emission reductions will require strategic and nuanced planning.

### What is the Carbon Market?

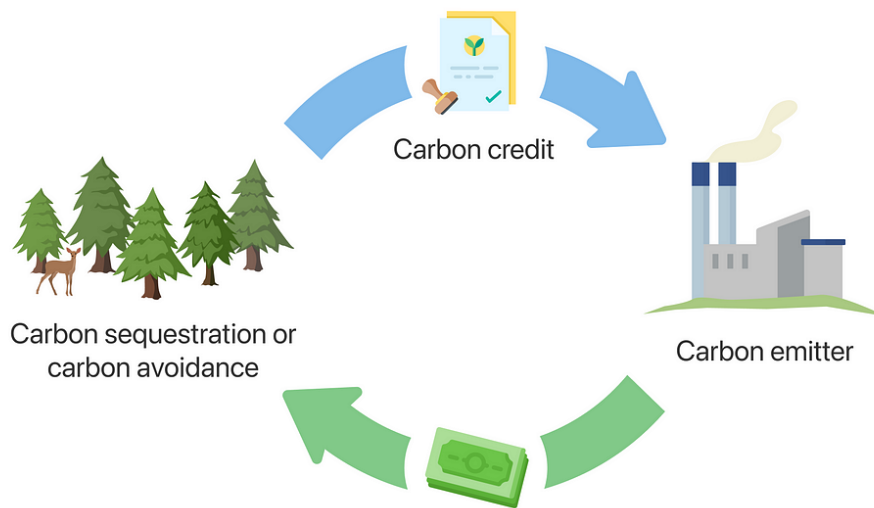
- **About:** Carbon markets are market-based mechanisms **designed to reduce greenhouse gas emissions** by creating a financial incentive for individuals and organizations to reduce their carbon footprint.
  - They operate on the **principle of cap-and-trade**, where a government or regulatory body sets a cap on the total amount of greenhouse gas emissions allowed within a specific jurisdiction.
- **Types of Carbon Markets:**
  - **Compliance Markets:** These markets are mandatory, requiring **regulated entities to purchase carbon credits to offset their emissions**. Often, these entities are large industrial polluters.
  - **Voluntary Markets:** These markets are voluntary, allowing individuals, businesses, and organizations to **purchase carbon credits to offset their emissions beyond regulatory requirements**.

- India is a significant exporter of carbon credits into the decentralized voluntary market, with its credits worth between **USD 200-300 billion** per year and accounting for **17% of the global supply in 2022**.

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- **Carbon Credits:** They represent a reduction in greenhouse gas emissions that can be traded. **One carbon credit equates to one ton of carbon dioxide equivalent (tCO<sub>2</sub>e)** reduced or avoided.
  - Carbon credits can be generated through various activities, such as:
    - Implementing **energy-efficient technologies**, reducing waste, or transitioning to renewable energy sources.
    - Preventing deforestation or **promoting reforestation**.



- **Carbon Taxes:** They are **direct levy on the emission of greenhouse gases**. This means that polluters pay a tax based on the amount of greenhouse gases they emit.
  - Carbon taxes generate **revenue for the government**, which can be used to fund climate mitigation and adaptation projects or reduce other taxes.
- **Global Trends in Carbon Markets:** As of August 2023, 74 carbon pricing mechanisms have been identified worldwide, in either the form of **carbon taxes** or **emissions trading schemes (ETS)**.
  - In 2023, carbon pricing revenues reached a record **USD 104 billion**, according to the World Bank's annual "**State and Trends of Carbon Pricing 2024**" report.

## What are the Current Government Initiatives Related to the Carbon Market in India?

- **Carbon Credits Trading Scheme (CCTS):** Building on the [Electricity Conservation Act, 2001](#), and the [Environment \(Protection\) Act, 1986](#), India launched the CCTS to reduce GHG emissions by trading carbon credit certificates.
  - The compliance segment of CCTS will commence in **2025-26**, allowing non-obligated entities to participate and trade carbon credit certificates (CCCs).
- **Other Existing Schemes:** The **Perform, Achieve and Trade (PAT) scheme** and the **Renewable Energy Certificates (REC) system** are existing market-based emission reduction schemes in India.
- **Monitoring and Verification:** The [Bureau of Energy Efficiency \(BEE\)](#) and the **National Steering Committee for Indian Carbon Market (NSCICM)** are responsible for ensuring the integrity of the carbon credits through rigorous monitoring, reporting, and verification processes.

## What are the Advantages of Implementing a Carbon Tax?

- **Incentivizing Green Innovation:** A carbon tax creates a strong financial incentive for businesses to reduce their **carbon footprint**, spurring innovation in **clean technologies**.
  - In India, where the renewable energy sector is growing rapidly, a carbon tax could accelerate this trend.
  - For instance, after implementing a carbon tax, British Columbia saw a **6.1% reduction in emissions** in sectors covered by the tax.
  - In India, it would also account for an estimated **15% of CO2 reductions (compared with**

baseline levels) from G20 countries.

- Applied to India, this could lead to significant **advancements in solar, wind, and energy storage technologies**, potentially positioning India as a global leader in clean tech innovation.

- **Revenue Generation for Climate Adaptation:** Carbon taxes can generate substantial revenue for governments to invest in climate adaptation and mitigation efforts.
  - In India, where climate change impacts are already severe, this could be crucial.
  - The [International Monetary Fund](#) estimates that carbon taxes could raise typically **1-2% of GDP for a USD 35 a ton tax in 2030**.
  - This funding could be directed towards **flood protection infrastructure, drought-resistant agriculture**, and other critical adaptation measures, helping to safeguard India's most vulnerable populations against climate impacts.
- **Improving Public Health:** By reducing fossil fuel consumption, a carbon tax can significantly **improve air quality and public health**. This is particularly relevant for India, where **air pollution is a major concern**.
  - As per the recent IMF Fiscal Monitor, a [carbon tax](#) of USD 50 per tonne of CO<sub>2</sub> in just the G20 countries can prevent **6,00,000 premature air pollution** deaths annually by 2030.
  - The resulting reduction in healthcare costs and improved productivity could provide a substantial boost to India's economy, potentially offsetting the initial economic impact of the tax.
- **Consumption Consciousness:** Carbon taxes can play a crucial role in raising awareness about the [carbon footprint of different products and services](#), thereby influencing consumer behavior.
  - In India, where consumer awareness about climate change is growing but still limited, a carbon tax could serve as an educational tool.
  - By making **carbon-intensive products more expensive**, it could nudge consumers towards more **sustainable choices**.
  - This shift could have **ripple effects across the economy**, encouraging businesses to offer more low-carbon options and accelerating the **overall transition to a sustainable economy**.

## What are the Major Challenges Related to Carbon Taxation in India?

- **Economic Impact on Industries:** Implementing a carbon tax could significantly impact [India's industrial sector](#), particularly energy-intensive industries like **steel, cement, and textiles**.
  - While it would incentivize cleaner production methods, it might also increase production costs in the short term.
  - This could potentially **affect India's global competitiveness in these sectors**, necessitating careful policy design to balance environmental goals with economic growth.
- **Regressive Nature-Burden on Lower-Income Groups:** Carbon taxes can be regressive, disproportionately affecting lower-income groups **who spend a larger proportion of their income on energy**.
  - Considering that India has the largest number of poor worldwide at 22.8 crore ([Global MPI 2022](#)), this is a critical concern.
  - A poorly designed carbon tax could lead to **increased energy and transportation costs**, potentially exacerbating economic inequality.
- **Limited Scope:** According to the [World Economic Forum](#), Carbon taxes, while effective in reducing CO<sub>2</sub> emissions from fossil fuels, have a limited scope.
  - They may not **adequately address other significant greenhouse gases** like **methane**, which is emitted in large quantities from agricultural activities.
  - For instance, **methane's warming potential is significantly higher than CO<sub>2</sub>**, making it a major contributor to climate change.
  - To comprehensively address greenhouse gas emissions, additional policies and regulations specifically targeting methane and other non-CO<sub>2</sub> gasses are essential.
- **The Informal Sector Conundrum:** [India's large informal sector](#), which accounts for **about 90% of the workforce**, poses significant challenges for carbon tax implementation.
  - **Tracking and taxing emissions from small, unregistered businesses** is extremely difficult and could inadvertently exempt them from a carbon tax, potentially **undermining its effectiveness and creating market distortions**.



- **Inter-State Disparities:** India's federal structure adds another layer of complexity to carbon taxation.
  - Different states have **varying levels of industrialization, energy mix, and fiscal capacities.**
  - A uniform national carbon tax could disproportionately affect **coal-producing states like Jharkhand and Chhattisgarh.**
- **Carbon Leakage:** Carbon leakage, where emissions-intensive industries relocate to **jurisdictions with laxer environmental regulations,** is a significant concern.
  - For India, which is striving to become a global manufacturing hub through initiatives like '[Make in India](#)', this risk is particularly acute.
- **International Trade Implications:** As more countries implement carbon pricing mechanisms, India's exports could face challenges in markets with stricter environmental standards.
  - The [European Union's proposed Carbon Border Adjustment Mechanism](#), for instance, could significantly impact Indian exports.
  - India's steel sector faces significant challenges due to the EU's carbon border tax, which could cost up to **USD 8 billion in exports to the EU.**

## What Measures can India Adopt for Effective Establishment of Carbon Market?

- **Phased Implementation-The Gradual Greening:** India could adopt a phased approach to carbon taxation, starting with **a low rate and gradually increasing it over time.**
  - This would allow industries to adapt and invest in cleaner technologies without sudden economic shocks.
  - The government could announce a **clear schedule of rate increases,** providing certainty for businesses to plan their investments.
  - Sectors could be brought under the tax regime in stages, **beginning with the most carbon-intensive industries.**
  - This approach would also allow time for the development of supporting infrastructure and policies, such as green energy alternatives and energy efficiency programs.
- **Border Carbon Adjustments- Leveling the Global Playing Field:** To address carbon leakage concerns and protect domestic industries, **India could consider implementing border carbon adjustments (BCAs).**
  - This would involve applying a **carbon price to imported goods based** on their embedded emissions, leveling the playing field for domestic producers.
  - This measure would need to be carefully designed to **comply with WTO rules and India's international trade commitments.**
- **Technology Transfer Incentives-Bridging the Innovation Gap:** The carbon tax could be coupled with strong incentives for technology transfer and **adoption of clean technologies, particularly for [small and medium enterprises \(SMEs\)](#).**
  - A portion of the tax revenue could fund a "Clean Tech Adoption Fund" providing low-interest loans or grants for green technology investments.
- **Green Lanes for Carbon-Conscious Industries:** Implement a tiered regulatory system that offers **expedited approvals and incentives for industries** demonstrating significant **carbon reduction efforts.**
  - This "**Green Lane**" approach could include faster environmental clearances, priority in government tenders, and access to low-interest green financing.
  - By creating **tangible benefits for carbon-conscious businesses,** India can accelerate the adoption of cleaner technologies across sectors.
  - This measure balances **economic growth with environmental responsibility,** encouraging industries to voluntarily embrace carbon reduction without imposing blanket regulations.
- **Carbon Credit Cooperative for SMEs:** Establish a cooperative framework enabling **small and medium enterprises (SMEs)** to collectively participate in the carbon market.
  - This system would **allow smaller businesses to pool their emission reduction efforts,** collectively generate carbon credits, and share the benefits.
  - By lowering the barrier to entry for SMEs, India can **broaden participation in the carbon market** and drive innovation in emission reduction at the grassroots level.
- **Carbon Tech Incubators for Homegrown Solutions:** Launch a network of specialized incubators focused on developing indigenous carbon reduction technologies.

- These incubators would provide **funding, mentorship, and testing facilities for startups** working on innovative solutions in areas like **carbon capture, energy efficiency, and renewable energy**.
- By fostering a robust ecosystem of homegrown climate tech, India can reduce dependence on imported technologies and create solutions tailored to its unique environmental and economic context.
- **Green Finance Revolution:** India could establish a robust green finance ecosystem to support its carbon market.
  - This could include **green bonds, sustainability-linked loans, and climate risk insurance products**.
  - A national green investment bank could be created to catalyze private investment in low-carbon projects.
- **Integration with Existing Schemes:** India's new carbon market should be integrated with existing schemes like PAT and REC for policy coherence.
  - This could involve **creating conversion mechanisms between different types of credits**.
  - A common trading platform could be developed to **enhance liquidity across schemes**.
  - Gradually, these schemes could be merged into a comprehensive national carbon market.

## Conclusion

India is at a pivotal moment, where establishing a **carbon market can effectively balance its climate goals with economic development**. By strategically designing this market, integrating existing schemes, and encouraging innovation, India can position itself as a global leader in sustainable growth. As India moves towards a **low-carbon future**, now is the time to act decisively and lead the way in creating a resilient, **climate-conscious economy**.

### **Drishti Mains Question:**

Discuss the concept of carbon credits and analyze their potential role in combating climate change, with a special focus on India's approach and challenges in integrating carbon credits into its environmental policies.

## UPSC Civil Services Examination, Previous Year Question (PYQ)

### Prelims

#### **Q. Consider the following statements (2023)**

**Statement—I** Carbon markets are likely to be one of the most widespread tools in the fight against climate change.

**Statement—II** Carbon markets transfer resources from the private sector to the State.

**Which one of the following is correct in respect of the above statements?**

- (a) Both Statement—I and Statement—II are correct and Statement—II is the correct explanation for Statement—I
- (b) Both Statement—I and Statement—II are correct and Statement—II is not the correct explanation for Statement—I
- (c) Statement—I is correct but Statement—II is incorrect
- (d) Statement—I is incorrect but Statement—II is correct

**Ans: B**

**Q. The concept of carbon credit originated from which one of the following? (2009)**

- (a)** Earth Summit, Rio de Janeiro
- (b)** Kyoto Protocol
- (c)** Montreal Protocol
- (d)** G-8 Summit, Heiligendamm

**Ans: B**

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