Charting Pathways for India's Carbon Market

Mannat Jaspal and Manjusha Mukherjee

Introduction

Carbon pricing has been described as a powerful and highly cost-effective instrument for reducing carbon emissions. However, implementing carbon pricing is not without its challenges, especially in emerging economies such as India. The two most important hurdles are insufficient capacity for designing and implementing the necessary instruments for carbon pricing, and the social implications of adopting them. This report identifies specific areas that must be addressed in the design of carbon markets, carbon trading, and carbon pricing in India and the Global South. This is all the more important because nearly two-thirds of all countries have indicated in their updated Nationally Determined Contributions (NDCs) that they are planning or considering the use of carbon pricing to fulfil their climate commitments.[1]

By definition, carbon pricing is a mechanism that internalises the cost of greenhouse gas (GHG) emissions in goods and services. The two most common approaches to carbon pricing in a compliance market are carbon taxes and emission trading systems (ETS), also called cap-and-trade systems. A carbon tax imposes a price on GHG emissions, typically through existing taxation systems, without directly limiting emissions. Meanwhile, an ETS system enables emitters to trade emission units to meet targets set by government, allowing the market to determine the price of carbon. These mechanisms can play a crucial role in driving emission reductions, catalysing investments in low-carbon technologies, generating government revenues, and fostering sustainable growth, thereby laying the foundation for a lower-carbon future.[2]

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Tailored carbon pricing policies have benefitted some of the G20 countries,[a] which include both highly industrialised and emerging economies. Together, G20 countries are responsible for around 80 percent of the world's GHG emissions.[3] Carbon pricing, either as a carbon tax or as an ETS, has been adopted by the majority of G20 members.[4]

In light of this, the Observer Research Foundation and Environmental Defence Fund (EDF) published a report in March 2024 titled "Navigating Carbon Pricing: the G20 Experience and Global South Prospects".[5] It assesses carbon pricing instruments from two perspectives: first, the social challenges associated with it which have made it a contentious issue, invoking scepticism over its positive trade-offs; and second, the efficacy of capacity-building programmes, which so far have been operating in silos and have been ineffective in enhancing institutional capacity in recipient countries.

The report findings were presented to a select group of stakeholders including policymakers, private sector experts, and members of civil society and academia to foster a dynamic and constructive conversation on navigating carbon pricing instruments in Global South countries. The insights from the discussion cast light on the future of carbon markets in India, particularly following the introduction of the Carbon Credit Trading Scheme (CCTS) in June 2023, which encompasses both the compliance market and the voluntary carbon market.[6] However, the focus of the report and the subsequent discussion primarily focused on the compliance market.

This special report builds on the key insights from the roundtable discussion and contextualises them within the Indian framework. It can serve as a foundation for policymakers in relation to the Indian carbon market.

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a These are Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, South Korea, Mexico, Russia, Saudi Arabia, South Africa, Türkiye, United Kingdom, and United States.

From G20 to the Global South: The Road to Carbon Markets

The G20 countries represent an array of economies, from advanced industrial nations to emerging markets in the Global South. When it comes to initiatives like carbon markets, there is notable disparity within this heterogeneous grouping. While many industrialised nations have established carbon trading systems as part of their efforts to combat climate change, not many emerging economies have done so.

The focus on carbon markets alone at the multilateral level tends to downplay other climate mitigation efforts undertaken by emerging economies like India. These have not been properly appreciated by the international community, which can often underestimate the development challenges confronting India and other emerging economies. Despite commitments, the pledged climate finance from developed nations to support developing economies in climate mitigation and adaptation has been far less than promised. India is a relatively poor nation and much of its economy is still informal. Its priority is delivering electricity to all and meanwhile, it is grappling with the challenge of reforming its power sector. Thus, there is need for a nuanced and inclusive approach that considers the unique socio-economic context of each nation, especially the ones which have to balance environmental sustainability with economic development and social equity.

The Emergence of the Indian Carbon Market

Carbon pricing is a widely used tool across the world and nearly a quarter of global GHG emissions are covered by carbon pricing initiatives.[7] Carbon markets have the potential to provide substantial finance for carbon mitigation and other government priorities. While India might eventually need a comprehensive carbon pricing system given the country's economic growth ambitions, climate goals, and finance requirements, the Indian economy may not be ready yet to take full advantage of this market instrument.

India's pioneering initiative—the Perform, Achieve and Trade (PAT) scheme launched in 2012[b]—was a first step towards establishing a market mechanism through enhanced energy efficiency in energy-intensive industry sectors. The mechanism aimed at incentivising industries to invest in energy-efficient technologies and practices, building their capacities and empowering them by fostering a culture of resource optimisation, competitiveness, and innovation.

India's National Carbon Market should be a step up from the PAT scheme.[8] While in the PAT scheme, the denomination for credits issued was based on energy savings, under the official Indian Carbon Market, the focus has shifted to carbon emissions reduction, marking a significant transition in the approach to emissions reduction and environmental sustainability.

b It is regarded as a flagship programme of the Bureau of Energy Efficiency under the National Mission for Enhanced Energy Efficiency (NMEEE).

Given the more complex and ambitious objective of emissions reduction compared to energy efficiency, industries will need to move beyond energy audits and leakage plugging into switching to cleaner fuel and adopting efficient technologies. This also implies, however, higher investment costs. To justify such investment, Indian industries want higher returns and a larger market to trade. The pressure to transition from Energy Saving Certificates (ESCerts) to carbon credits through a domestic carbon market thus came from Indian industry. To support it, the Ministry of Power took the step of notifying the Carbon Credit Trading Certificate (CCTS) scheme in June 2023 under the Energy Conservation Amendment Act, 2021.

The Indian Carbon Market, which is in the process of being formulated, will in a few years become a full-fledged compliance market like the European Union's (EU) ETS and aims to be among the top three global carbon markets by 2030. There is also a need for affordable and competitive technologies and the carbon market plays a role in driving innovation and promoting the uptake of such emerging technologies.

The Purpose of a Carbon Market in India

The purpose of carbon markets in developing countries like India differs from those already designed in the West and China. In the developed world, carbon markets are meant to reduce total absolute emissions; in India, their purpose, at least in the short to medium term, is to increase energy efficiency and reduce emissions per unit of output, while continuing to drive economic expansion (which will result in increased emissions.) India has yet to reach its emission peak in its present development trajectory. The goal is to move towards a more efficient use of energy, switching from fossil fuels to renewable energy as power generation increases.

India's total energy consumption will undoubtedly continue to increase to meet the country's economic and developmental priorities. While decarbonisation and net-zero are longer-term goals for India going by its NDCs, the 2030 goal aims only to reduce overall emission intensity. This is in contrast to the developed nations where carbon pricing is a key tool to decarbonise. Even so, the purpose of the Indian carbon market should be to go beyond emission reduction and ensure cleaner sources of energy, managing demand transitions, attracting investments, and promoting adoption of energy-efficient technologies.

Challenges and Opportunities

Technology transfer

Technology transfer and international finance are crucial for the transition, and therefore an imperative is global cooperation and support. For example, India is yet to build clean energy capacity beyond its solar and on-shore wind sectors—other forms such as nuclear power, solar thermal, green hydrogen and off-shore wind are relatively under-resourced. Even in renewable energy, the country employs very little storage technology or capacity (given the technology is still underdeveloped and expensive), which is critical for transitioning under a well-functioning carbon market. India's Ministry of Environment, Forests and Climate Change has notified a list of such technological capacities that need to be developed for trading carbon credits in the global carbon market under Article 6.2 of the Paris Agreement.

Renewable energy

India has set itself an audacious national target of generating 500 GW of electricity from renewable energy sources by 2030. (Its current generation is around 145 GW.)[9] There are challenges, however—barring a few components, the country's solar industry depends almost entirely on imports. Domestic manufacturing of polysilicon (the fundamental raw material for solar cells) is almost non-existent.

India launched a 'National Programme on High Efficiency Solar Photo Voltaic (PV) Modules' in April 2021 as part of its Production Linked Incentive (PLI) scheme which, in its two phases, has chosen 14 bidders to manufacture solar modules locally by entering into technology agreements with global players.[10] The task of incentivising the sourcing and manufacturing of solar sector components despite insufficient domestic capacity also offers an opportunity for the Indian carbon market to develop and promote an in-house manufacturing-driven supply chain.

Power sector reforms

India's current transmission infrastructure is highly inefficient for energy pricing, with nearly 50 percent of electricity consumption lacking proper pricing mechanisms. Nearly one-third of all electricity generated is allocated to agriculture, which is heavily subsidised. Many states also allocate free electricity units (up to a ceiling) for households, undermining the effectiveness of price signals. Addressing such inefficiencies is essential.

Transparency, accountability, and other issues

There is a need for transparency, accountability, and stakeholder engagement in designing and implementing carbon market mechanisms. To begin with, carbon credits should be defined as an asset class within the domestic carbon market. This was necessary for three reasons: first, to provide legitimacy to carbon credits as tradable instruments, fostering investor confidence and attracting capital into the carbon market; second, to enhance market liquidity and efficiency, facilitating the exchange of emission allowances among regulated entities and enabling price discovery based on supply and demand dynamics; and third, to encourage market participants to view emissions reductions as valuable assets with financial value.

Moreover, the informal nature of much of the Indian economy could hinder broad-based participation in a formalised market mechanism. There is a need for mature technologies in the hard-to-abate industries, ensuring sector-specific strategies, identification of technologies and opportunities in forestry, agriculture, and other sectors.

Design Elements of the Carbon Market

The following paragraphs outline the key design aspects that will be essential to India's carbon market.

a. Dynamic target or allowance setting: Targets or allowances should be adjusted periodically to accommodate fluctuations in demand and supply so as to avoid floating of excess certificates (which did happen with the PAT scheme).

b. Revenue recycling: Revenue recycling from carbon pricing is important, be it through taxes or market mechanisms. Such revenues could be directed towards financing priority sectors and communities. This would not only contribute to equitable distribution but also address economic disparities.

c. Price stability: Stability in carbon prices is a critical factor. (The EU ETS, for instance, has seen a number of price crashes.) Such stability is crucial for investment certainty, forecasting of compliance cost, market confidence, and to avoid market inefficiencies such as hoarding of allowances when prices dropped or panic selling when they spiked. There is a need for tailored solutions for domestic situations while leveraging insights from global experiences.

d. Sectoral approach: Sectors that can integrate into the CCTS scheme should be identified carefully. The process would entail evaluating emission trajectories and establishing targets for eligible sectors. Sector-specific obligations and incentives to drive the adoption of

clean technologies and mitigate emissions across industries should be set. Aligning carbon market initiatives with the country's NDCs is also essential.

Benefit Sharing and Equity

Accessibility and affordability of energy are crucial, particularly for transportation and cooking. The potential impact of carbon pricing on energy usage and affordability must be considered, particularly for sectors and communities heavily reliant on fossil fuels. Equally important is considering equity, benefit sharing, and alignment with broader climate policy objectives.

Capacity Building and Collaboration

A transparent and globally integrated system must be established to maximise the effectiveness of carbon market mechanisms. An imperative is capacity building and access to reliable data to support the design and implementation of carbon market initiatives.

In particular, there should be a national inventory management system dedicated to capturing relevant carbon-related data, and collaboration among government entities, research organisations, and industry stakeholders must be nurtured to enhance capacity-building efforts within the G20 countries, especially the developing economies. This is needed in order to develop carbon market frameworks that not only align with domestic priorities but also adhere to international standards.

Peer Learning

Much could be learnt from the experiences of the EU's ETS and China's provincial and national ETS. An idea to be explored is the setting up of sub-national ETS pilots in different parts of India, which could be a means of developing customised solutions to address the unique dynamics of each region—its industries, socio-economic diversity, energy mix, and access to resources. Such pilots could also provide a controlled environment for testing and refining emissions' trading mechanisms for different sectors before they are integrated into the Indian carbon market. They

could facilitate building capacity at the local level, foster greater participation and buy-in from key actors, and provide opportunities for policy learning and knowledge exchange. As a case in point, Surat and Ahmedabad have implemented emission trading schemes for particulate pollution to help regulate and reduce emissions.[11]

Integration with Global Markets

Domestic carbon markets in India or in the rest of the Global South cannot be designed exactly like the EU's ETS. The price of carbon would vary greatly, given the different levels of industrialisation and different aims of each system. There would also be stark differences in the stage of economic development, energy access, market size, economic structure, regulatory framework, and policy context.

Even if prices vary across carbon markets, however, the possibility of trade negotiation across market boundaries must be considered in the design of the Indian carbon market.

Despite all other complex economic and social dynamics, the importance of climate action and the role of carbon markets in facilitating the transition to a low-carbon future cannot be denied. Carbon pricing is by no means a silver bullet, but by leveraging its unique strengths, embracing innovation, and fostering international collaboration, much can be achieved.

Endnotes

1 Climate Watch, "NDC Enhancement Tracker," https://www.climatewatchdata.org/2020-ndc-tracker

2 United Nations Framework Convention on Climate Change, "About Carbon Pricing," https://unfccc.int/about-us/regional-collaboration-centres/the-ciaca/about-carbon-pricing

3 Organisation for Economic Co-operation and Development Web archive, https://web-archive.oecd.org/2021-10-27/614338-g20-economies-are-pricing-more-carbon-emissions-but-stronger-globally-more-coherent-policy-action-is-needed-to-meet-climate-goals-says-oecd.htm

4 Mannat Jaspal, Manjusha Mukherjee and Aurora Silitonga, "Navigating Carbon Pricing: The G20 Experience and Global South Prospects," ORF Expert Speak, February 2024, Observer Research Foundation.

5 Pedro Martins Barata et al., *Navigating Carbon Pricing: The G20 Experience and Global South Prospects*, March 2024, Observer Research Foundation.

6 Manas Agrawal, "Carbon Credit and Trading Scheme for Indian Carbon Market to be amended soon," October 2023, *Down to Earth*, https://www.downtoearth.org.in/news/climate-change/carbon-credit-and-trading-scheme-for-indian-carbonmarket-to-be-amended-soon-92492#:~:text=Published%3A%20Thursday%2026%20October%202023&text=The%-20Carbon%20Credit%20and%20Trading,of%20Energy%20Efficiency%20(BEE)

7 The World Bank, State and Trends of Carbon Pricing Dashboard, https://carbonpricingdashboard.worldbank.org/compliance/coverage

8 Bureau of Energy Efficiency, "Perform Achieve and Trade", Ministry of Power, Government of India, https://beeindia.gov.in/en/programmesnmeee/pat

9 Invest India, https://www.investindia.gov.in/sector/renewable-energy#:~:text=India's%20installed%20non%2Dfossil%20fuel,additions%20of%209.83%25%20in%202022.

10 Ministry of New and Renewable Energy, https://mnre.gov.in/production-linked-incentive-pli/#:~:text=Overview,outlay%20of%20Rs.%2024%2C000%20crore.

11 "Ahmedabad becomes second city in country to implement emissions trading scheme," *Hindustan Times*, September 2023, https://www.hindustantimes.com/cities/others/ahmedabad-becomes-second-indian-city-to-implement-emission-trading-scheme-ets-to-reduce-pollution-levels-101693975863517.html

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