



Evaluation And Analysis Of Carbon Markets In India:

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Abstract:

In essence, the voluntary carbon market relies on independent certification bodies and their standards to ensure the credibility of carbon credits, leading to fragmentation due to the presence of multiple entities. This fragmentation, coupled with varying perceptions of credit quality, influences the demand and pricing dynamics within the market. These two types of markets function differently and have distinct objectives. The key difference lies in what is being bought and sold. Both markets deal with a tonne of CO₂, but in an Emissions Trading System (ETS), companies trade pollution permits (often referred to as "allowances") that permit them to emit one tonne of CO₂. When a company emits 1tCO₂, it must surrender one permit to the regulator. In contrast, an offsetting mechanism involves the trade of offsets, or emission reduction units, which represent a tonne of CO₂ that has already been reduced. Offsets can only lead to a zero-sum game, because one tonne of CO₂ is emitted somewhere, and one tonne is reduced somewhere else. Hence, they cannot be used to reduce emissions in the long term and are not compatible with the idea of going towards net-zero emissions at a global level. Offsets should only be used to compensate for emissions that cannot be avoided or reduced¹. The paper looks into all these aspects.

¹ Carbon markets 101: The Ultimate Guide to Global Offsetting Mechanisms. Ver 2.0, July 2020. [Available at: <https://carbonmarketwatch.org/wp-content/uploads/2020/07/CMW-ENGLISH-CARBON-MARKETS-101- THE-ULTIMATE-GUIDE-TO-MARKET-BASED-CLIMATE-MECHANISMS-FINAL-2020-WEB.pdf>]

Introduction:

Recognizing the lack of governmental oversight, the voluntary offset industry has acknowledged the need for quality assurance mechanisms to maintain the credibility of voluntary offsets. Over the past decade, more than a dozen voluntary offset standards have emerged, each with a slightly different focus. Some standards closely resemble those in compliance markets, while others focus on unique project types. Certain standards are restricted to specific categories (e.g., forestry), whereas others exclude particular types to emphasize the social benefits of carbon projects. It is noteworthy that the vast majority of voluntary offsets currently lack certification from multiple standards, although this trend is expected to change as the industry evolves².

At present, four major groups play a pivotal role in establishing standards and providing process guidance: ART, Verra, Gold Standard, and the American Carbon Registry. These prominent entities, along with a few smaller, less renowned organizations, are followed for the issuance of carbon instruments traded across various voluntary and compliance markets.

In essence, the voluntary carbon market landscape is shaped by the standards and guidelines set forth by four leading groups – ART, Verra, Gold Standard, and the American Carbon Registry. In summary, the voluntary offset industry has developed numerous standards over the past decade to ensure quality assurance and maintain credibility in the absence of governmental regulation. These standards differ in focus, project types, and emphasis on social benefits. While most offsets are currently certified by a single standard, the industry is anticipated to see an increase in multi-standard certification in the future.

Voluntary carbon offset projects require the participation of numerous entities, stakeholders, and governing bodies throughout their design, implementation, and operational phases. Although the exact parties engaged may vary across projects, certain categories and types of market participants remain consistent irrespective of the specific project.

Project Owners are the operators and owners of the physical installation where the emission reduction project takes place. They can be private individuals, companies, or other organizations.

Project Developers are entities, which could be the project owners themselves, consultants, or specialized service providers, with the intention to develop an emission reduction project.

² Warnecke, Carsten; Day, Thomas; Schneider, Lambert; Cames, Martin; Healy, Sean; Harthan, Ralph; Tewari, Ritika; Höhne, Niklas (2017): Vulnerability of CDM projects for discontinuation of mitigation activities: assessment of project vulnerability and options to support continued mitigation.

They scope out projects, file documents for registration and certification, obtain funding, physically create the project, and eventually sell to project owners.

Project Funders include banks, private equity firms, private investors, non-profit organizations, and others that may lend or invest equity to fund a project, subject to offset program rules on acceptable funding sources besides offset revenue.

Validators and Verifiers (Third-Party Auditors) are required by most offset programs to validate a project's baseline, projected emissions reductions, and verify achieved reductions. They need accreditation, with some standards mandating separate auditors for validation and verification.

Standards Organizations define the rules and criteria for voluntary emission reduction credits, certify proposed projects, maintain registries recording offset transactions and retirements.

Brokers and Exchanges facilitate offset trading, with brokers handling non-standardized products, occasional trades, and small volumes, while exchanges prefer frequent, large-volume trades of standardized contracts.

Traders are professionals who purchase and sell emission reductions, taking advantage of market distortions and arbitrage opportunities.

Offset Retailers provide a convenient way for consumers and businesses to access offset credits from a portfolio of projects sourced from brokers or developers.

Final Buyers or End-Users are individuals and organizations that purchase and retire carbon offsets to counterbalance their GHG emissions, as recorded in the registry of the certifying standards organization.

Voluntary carbon offsets may be issued several years after the emissions reduction or removal has taken place due to the lengthy process involved in issuing and verifying the offsets. First, an action is undertaken to avoid or reduce carbon emissions. This reduction is then verified by a third party, typically at the end of the calendar year. After verification, the offset credits are issued. The "vintage year" denotes the year in which the emission reduction or removal occurred, while the "issuance year" indicates the year when the offsets are actually issued.

To ensure the quality and credibility of voluntary offsets, the voluntary carbon market is governed by various standards. Although these standards and protocols may have different objectives and services, they share a common goal: to provide offset credit sellers with quality assurance certification and offer

offset consumers greater transparency, thereby fostering confidence in the credibility and integrity of certified offsets. To achieve this, these standards regularly publish and update guidelines for validating offsets, certify auditors authorized to validate and verify offset projects, and implement procedures to prevent conflicts of interest³.

In essence, the voluntary carbon market encompasses a diverse array of standards that, despite their differences, aim to uphold the quality and credibility of voluntary offsets through robust validation processes, auditor certification mechanisms, and measures to ensure impartiality and transparency.

Furthermore, while quality concerns exist for compliance programs, such as those surrounding the free allocation of carbon credits under the EU ETS, these concerns do not impact the trading volume of compliance credits. As long as companies are legally and regulatorily required to purchase credits, they remain willing to do so. Quality concerns are addressed through the political process governing the compliance scheme. Meanwhile, in the voluntary carbon offsets market, quality concerns directly impact the market size.

Quality is a primary concern for the voluntary offsets market, alongside the costs of issuing offsets. The standards organizations and auditors already have substantial processes for validating and verifying projects, evidenced by the significant lag of almost three years between project activities and offset issuance. Any attempts to further increase quality through additional processes and verifications would likely increase costs for participants and lengthen the issuance timeline.

The selection of one system over the other results in markedly different climate goals. In an Emissions Trading System (ETS), the government maintains complete control over the total CO₂ emissions, as the collective emissions of companies cannot exceed the total number of distributed allowances. Conversely, under an offsetting mechanism, the government may establish a theoretical emission limit, but companies are free to emit any amount, provided they purchase offsets. This approach allows companies to pay others to reduce emissions rather than reducing their own emissions directly.

³ York, Ingrid; Kerschner, Seth; Smithers, Julia (2020). Voluntary Carbon Markets: A Blueprint. White & Case. <https://www.whitecase.com/publications/alert/voluntary-carbon-markets-blueprint>

The Clean Development Mechanism (CDM) was established under Article 6 of the Kyoto Protocol (1997) to enable developed countries to purchase emission reductions from developing countries in the form of Certified Emissions Reductions (CERs). The CDM aims to help developed countries meet their climate commitments while supporting sustainable development in developing countries. However, evidence regarding the mechanism's success remains mixed at best⁴.

To be eligible for selling credits under the CDM, projects must meet specific criteria and be approved and verified by organizations registered under the UNFCCC. Since the mechanism's inception, numerous project-specific methodologies have been developed to determine the contribution of a particular activity to emission reductions.

To ensure that credits traded under the CDM represent effective climate action, they must be backed by emissions reductions that are real, additional, verifiable, and permanent. This means the reductions must be genuine (real), would not have occurred without the mechanism (additional), are lasting (permanent), and can be accurately traced to a specific project and activity (verifiable). Additionally, projects issuing credits should benefit local communities and contribute to their sustainable development.

The environmental integrity of the Clean Development Mechanism (CDM) is contingent upon whether the projects undertaken are truly additional to business-as-usual scenarios, thereby contributing to emissions reduction. However, evidence remains inconclusive regarding the CDM's ability to provide financial support for mitigation projects, given the oversupply of credits and their low prices⁵. The impact of these low prices on the continuation of CDM crediting activities could have indirectly affected overall mitigation efforts. While acknowledging the mixed evidence surrounding additionality and the problematic cases of fossil fuel projects, it is essential to recognize the CDM's significant contribution to technology transfer, employment generation, and capacity building in low-carbon development for developing countries.

In essence, while the CDM's environmental integrity is linked to the additionality of projects, and its financial support has been hampered by oversupply and low prices, its positive impact on technology

⁴ The Clean Development Mechanism: Local Impacts of a Global System. October 2018. Available at: [<https://carbonmarketwatch.org/wp-content/uploads/2018/10/CMW-THE-CLEAN-DEVELOPMENT-MECHANISM-LOCAL-IMPACTS-OF-A-GLOBAL-SYSTEM-FINAL-SPREAD-WEB.pdf>]

⁵ DEHSt, (January 2018) "Discussion paper: Marginal cost of CER supply and implications of demand sources". Available at: [<https://newclimate.org/wp-content/uploads/2018/03/Marginal-cost-of-CER-supply.pdf>]

transfer, job creation, and low-carbon development capacity in developing nations should not be overlooked⁶.

In the ETS methodology, the industry gets permit to cause emissions up to the limit defined by the respective government. Ideally, under the ETS methodology, the industries should meet certain emission reduction parameters and such allowances to mitigate unavoidable emissions only. On the other hand, in the offsetting mechanism, industries who fail to meet the defined emission limit, must purchase CERs of such value which is equivalent to country's prevalent green tax. Prima facie, the industries should not have a free pass to continue GHG emissions while claiming net zero by purchasing CERs at low prices. In such cases, the CDMs ought to fix minimum prices of CERs generated under the CDM registered project so that the offset projects do not suffer from being forced to sell CERs at throw away prices at the behest of the industries⁷.

INDIA: REGULATORY FRAMEWORK TO CARBON MARKETS

India is a party to the UNFCCC and acceded to the Kyoto Protocol in August 2002. Recognizing India's significant potential as a subcontinent to combat climate change, the Government of India adjusted its policies to align with the objectives of the Kyoto Protocol. In COP 8 held on 2002 at New Delhi, India had emphasized on the need of financial resource to help developing countries to adopt the adverse impact of climate change, however, it had firm stance that there can be any emission commitments from developing countries. Furthermore, it was at COP 8 that India acceded to CDM.

In COP 13 at Bali, India called for developed nations to provide compensation to developing countries for their efforts in afforestation drives and avoiding deforestation. This demand was accepted by the key decision-making Contact Group of the conference. Additionally, India highlighted the inadequate performance of wealthy countries in reducing greenhouse gas emissions, a claim supported by data from the United Nations.

⁶ CDM Policy Dialogue, (2012) "Assessing the Impact of the Clean Development Mechanism report Commissioned by the High-Level Panel on the CDM Policy Dialogue". Available at: http://www.cdmpolicydialogue.org/research/1030_impact.pdf

⁷ DEHSt, (May 2017) "Vulnerability of CDM Projects for Discontinuation of Mitigation Activities: Assessment of Project Vulnerability and Options to Support Continued Mitigation". Available at: <https://newclimate.org/wp-content/uploads/2017/05/vulnerability-of-cdm.pdf>

In essence, India advocated for financial support from rich countries to developing ones as they work on increasing forest cover and curbing deforestation. India also criticized the insufficient progress made by affluent nations in curtailing their greenhouse gas emissions, citing UN data to reinforce this stance.

On April 16, 2004, the Ministry of Environment and Forests (Climate Change Division) issued an order under the authority of sub-sections (1) and (3) of section 3 of the Environment(Protection) Act, 1986, establishing the National Clean Development Mechanism Authority (NCDMA). This NCDMA is a cross-functional team comprising several government departments, including the Secretary (Environment & Forest), Foreign Secretary, Finance Secretary, Secretary of Industrial Policy and Promotion, and Secretary (Ministry of Power).

The NCDMA is authorized to receive, evaluate, and approve projects in accordance with the guidelines and criteria specified in the relevant rules and CDM modalities, as well as any additional guidelines issued periodically. The evaluation process for CDM projects includes assessing the likelihood of successful implementation and determining the extent to which projects align with national sustainable development objectives.

Furthermore, the National Clean Development Mechanism Authority (NCDMA) holds the power to recommend additional requirements to ensure that project proposals align with national sustainable development priorities, adhere to legal mandates, resonate with local concerns, and involve adequate stakeholder consultation. The NCDMA bears the responsibility of maintaining a registry of approved CDM projects and their potential for Certified Emission Reductions (CERs), as well as confirming the actualization of these CERs.

In essence, the NCDMA wields the authority to impose supplementary criteria on project proposals to guarantee their conformity with national sustainable development goals, legal requirements, local priorities, and stakeholder engagement protocols. Moreover, it is entrusted with the task of maintaining a registry of approved CDM projects, their prospective CER generation, and verifying the realization of these CERs.

The NCDMA had from its inception till 2015 had approved Host Country Approval to 2941 projects which facilitated investment of Rs. 579,306 crores⁸. These projects are in energy efficiency, fuel switching, industrial processes, municipal solid waste, renewable energy and forestry which spread across the country (covering all states in India). Certified Emission Reductions (CERs) issued to Indian projects is 191 million (13.27%). The NCDMA at its inception required submission of hard copies of the projects for consideration of approval. The Ministry of Environment and Forest undertook digital transformation and launched the website through which applicants can submit their documents and also reduce processing time. In 2015, NCDMA shifted to new website.

So, the Government of India, keeping up pace with evolving changes in relation to GHG emissions undertook statutory framework to ensure India or its resources or the stakeholders of the projects are not subject to any such exploitation by external third parties.

The Government of India had announced the National Action Plan on Climate Change (NAPCC) on 30th June 2008 outlining eight National Missions on climate change. These include⁹:

1. National Solar Mission
2. National Mission for Enhanced Energy Efficiency
3. National Mission on Sustainable Habitat
4. National Water Mission
5. National Mission for Sustaining the Himalayan Eco-system
6. National Mission for a Green India
7. National Mission for Sustainable Agriculture
8. National Mission on Strategic Knowledge for Climate Change

The National Action Plan on Climate Change (NAPCC) delineated eight national missions, representing long-term and integrated strategies for attaining key objectives in the context of climate change. The National Mission for Enhanced Energy Efficiency (NMEEE) was one of the eight missions launched under the NAPCC. The implementation plans for NMEEE were entrusted to the

⁸ Press Information Bureau, Government of India: Ministry of Environment, Forest and Climate Change on 02 November 2015. [Available at: <https://archive.pib.gov.in/archive2/erelease.aspx>]

⁹ Refer Department of Science & Technology's National Missions outlines [Available at: <https://dst.gov.in/climate-change-programme>]

Ministry of Power and the Bureau of Energy Efficiency. NMEEE unveiled the following four initiatives¹⁰:

1. Perform Achieve and Trade Scheme (PAT)
2. Market Transformation for Energy Efficiency (MTEE)
3. Energy Efficiency Financing Platform (EEFP)
4. Framework for Energy Efficient Economic Development (FEEED)

PERFORM ACHIEVE AND TRADE (PAT)

The PAT system was introduced as a key measure to reduce GHG emissions in India. Its primary objective is to lower specific energy consumption in energy-intensive industries. Additionally, the system incorporates a market-based mechanism to improve cost-effectiveness by certifying excess energy savings, which Designated Consumers can trade.

The PAT mechanism was established under the Energy Conservation Act of 2001, which authorizes the Central Government to designate certain energy-intensive industries, as listed in the Act's Schedule, as Designated Consumers (DCs).

The Bureau of Energy Efficiency (BEE) conducted sector-specific studies to establish energy consumption norms and standards. These studies revealed a significant variation in Specific Energy Consumption (SEC) within industrial sectors, indicating substantial energy-saving potential. To set targets for Designated Consumers, the BEE undertook extensive groundwork to design a transparent, flexible, efficient, and robust PAT system. In developing the PAT Scheme, the BEE also engaged with key stakeholders, including Designated Consumers, Energy Auditors/Managers, Industry Associations, and academics, to gather feedback and refine the mechanism.

Section 14A(1) of the Energy Conservation Act, 2001 empowered the Central Government to issue energy savings certificates to the designated consumer whose energy consumption is less than the prescribed norms and standards. The value of 1 (one) energy savings certificate (ESCert) is equal to one metric ton of oil equivalent of energy consumed. The value of per metric ton of oil equivalent of

¹⁰ <https://beeindia.gov.in/en/programmes/perform-achieve-and-trade-pat>

energy consumed were to be prescribed by the Central Government in consultation with BEE under section 14B of the Energy Conservation Act, 2001. The Ministry of Power further notified the Energy Conservation Rules, 2012 (PAT Rules) on 30th March 2012 and specified that the ESCerts to be issued in electronic form and tradable on Power Exchange. These Power Exchanges are regulated by the CERC which is duly empowered under the Electricity Act, 2003¹¹.

Thus, India had a trading of ESCert which laid the groundwork for CERs framework. With ever changing business and globalization necessitates that there is proper regulatory framework to tackle any new challenges arising out of it. For example, to promote competition in markets, Monopolistic and Restrictive Trade Practices Act (MRTP Act) were promulgated. However, owing to practical challenges faced by the MRTP Act, the same was replaced by Competition Commission of India Act.

Designated Consumers who have successfully met their obligations under the PAT scheme will be awarded ESCerts which can be sold on the Power Exchanges. Designated Consumers who have failed to meet their obligations under the PAT scheme will be required to purchase ESCerts and submit them to BEE in order to show compliance under the PAT scheme. Once the ESCerts are submitted for compliance the same cannot be used again to meet next years compliance requirements. The ESCerts are therefore expired or retired once the same has been submitted for compliance.

In Power Exchange, one of major issue for PAT scheme to fail was that there was no minimum floor price at which ESCerts will be discovered. However, the same was addressed when Central Electricity Regulatory Commission (Terms & Conditions for Dealing in Energy Savings Certificates) Regulations, 2016 was promulgated by the CERC.

The initial PAT Cycle-1 encompassed eight sectors: Aluminum, Cement, Chlor-Alkali, Fertilizer, Iron & Steel, Pulp & Paper, Thermal Power Stations, and Textiles. During PAT Cycle-II, the scope was widened to include three additional sectors: Petroleum Refineries, Railways, and Distribution Companies (DISCOMs). Further widening occurred in PAT Cycle-IV, with the inclusion of two more sectors: Commercial Buildings (Hotels and Airports) and Petrochemicals.

In essence, the PAT mechanism underwent a progressive expansion, starting with eight core

¹¹ Refer section 66 read with clause (y) of subsection 2 of section 178 of the Electricity Act, 2003.

sectors in Cycle-1, followed by the addition of three new sectors in Cycle-II, and a further two sectors in Cycle-IV, thereby broadening the coverage and impact of the energy efficiency initiative.

The PAT cycles started from 2012 and was valid for 3-year period. The 1st PAT cycle commenced from 2012 – 15 and currently PAT VII is ongoing. The success of PAT Cycle-I led to energy savings of 8.67 million TOE. As a result of exceeding their targets, the Designated Consumers (DCs) were awarded tradable Energy Saving Certificates (ESCerts). In total, 309 DCs surpassed their targets, generating 3.825 million positive ESCerts. Conversely, 110 DCs did not meet their targets and needed to purchase a total of 1.425 million ESCerts. Of these, 96 DCs complied by buying ESCerts. In 17 trading sessions, 1.29 million ESCerts were traded, with a total trading value of 100 crore INR and a weighted average price of INR 768.5 per ESCert¹². In essence, PAT cycle 1 was a buyer's market.

Under the current rules, ESCerts from PAT Cycle 1 will expire after the PAT Cycle 2 compliance period if they are not traded during the upcoming PAT Cycle 2 trading sessions. This impending expiration may lead to a rush to sell the certificates, potentially resulting in a lower Market Clearing Price (MCP) for ESCerts in the final trading sessions. The PAT scheme has significantly reduced emissions in the Indian economy. However, there has been a surplus of ESCerts in the market, evident in PAT Cycle-I and expected to continue into PAT Cycle-II. This ongoing surplus, coupled with muted demand, is likely to sustain lower ESCert prices, which could eventually discourage Designated Consumers from investing in energy efficiency technologies.

The PAT scheme operates on the premise that the price of ESCerts should incentivize entities to either invest profitably in energy efficiency or buy ESCerts cost-effectively. To maintain a stable price signal, addressing the supply-demand gap is crucial. The major barriers in PAT scheme is that it was limited only to Designated Consumers and not the entire industry as such which could have driven the demand higher. Furthermore, it was abundantly clear that Designated Consumers who had failed to meet the criteria under the PAT system was required only to purchase those many ESCerts to meet the obligations. The PAT system can be stated as a measure taken by the Government of India to reduce GHG emissions by incentivising the energy intensive industries to reduce energy consumption and move to a more sustainable methodology which would reduce

¹² Refer: Booklet – Achievements under PAT [Available at: https://beeindia.gov.in/sites/default/files/Booklet_Achievements_under_PAT_May_2017.pdf]

dependency on the carbon based fuels.

Furthermore, the trading period of the ESCert is limited and owing to lack of demand, ESCerts were susceptible to expiry than to sale. Furthermore, being this being India specific and therefore had no demand in foreign jurisdictions as well. The trading of Energy Saving Certificates (ESCs) takes place at power exchanges upon the conclusion of each three- year PAT cycle. However, during the inaugural PAT cycle, the trading window lasted for a mere four months. Such a condensed timeframe for trading poses challenges in attracting a substantial number of buyers and sellers to the exchanges, hindering an increase in traded volume and optimal price discovery.

In essence, the brief trading period of approximately four months during PAT cycle one presented obstacles in garnering significant participation from both buyers and sellers on the power exchanges. This limited participation consequently impeded the growth of traded volumes and hampered effective price discovery mechanisms, underscoring the need for an extended trading window to foster a more robust and efficient market. ESCerts are not denominated in terms of GHG reductions, which serves as the default trading unit in most compliance-based and voluntary carbon markets worldwide.

Conclusion: In conclusion it can be said introducing a provision for the fungibility of unit trading from energy saving to emission reduction may attract voluntary buyers (and future sellers, if required) to participate in the ESCerts market. Such a move would enhance the fungibility of the trading instrument (in the short and medium term), and in the long run, it may lead to international participation in the market as the adoption of the instrument increases.