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Feature Story

Carbon Market: Institutionalising Market Based Mechanism For Supporting Sustainable Development 02

CARBON MARKET: INSTITUTIONALISING MARKET BASED MECHANISM FOR SUPPORTING SUSTAINABLE DEVELOPMENT

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Introduction

The threat of the climate change has been duly recognised and countries all over the world have declared their targeted emission reduction goals (i.e., Nationally Determined Contributions) post the historic Paris Climate Accord in 2015. Even though the nations have declared their NDCs, according to the recently released 'Emission Gap Report 2021' by UNEP, to get on track to limit global warming to 1.5°C, the world needs to take an additional 28 GtCO2eq reduction in the annual emissions by 2030, over and above what is promised in updated unconditional NDCs. India has also set and ambitious target to reduce carbon intensity by 45% by 2030 (w.r.t 2005 levels) and to become a Net zero nation by 2070.

According to UNEP Emission Gap Report, currently, the global CO2eq emission from all sources stands at around 58.1 GtCO2 eq of which fossil fuel-based emissions alone is about 36 GtCO2eq. In order to accelerate the efforts against climate change, there is an urgent requirement to channelise the climate finance and funding towards sustainable projects. One of the recent successes of COP26 was the finalisation of the Paris rulebook through agreement on Article 6 that calls for cooperative approaches among all signatories to Paris Agreement. As per recent discussion paper floated by International Emission Trading Association (IETA), the potential cost reductions that may be achieved through Article 6 cooperation are estimated to exceed $300 billion per year when compared with the independent implementation of NDCs by countries. Thus, the role of efficient and transparent market-based instruments is crucial to accelerate climate finance as well as to provide a revenue stream to the sustainable project developers. Both compliance and voluntary carbon market are crucial to create a transparent model and provide price signals to the drive the investment.

Understanding Carbon Market

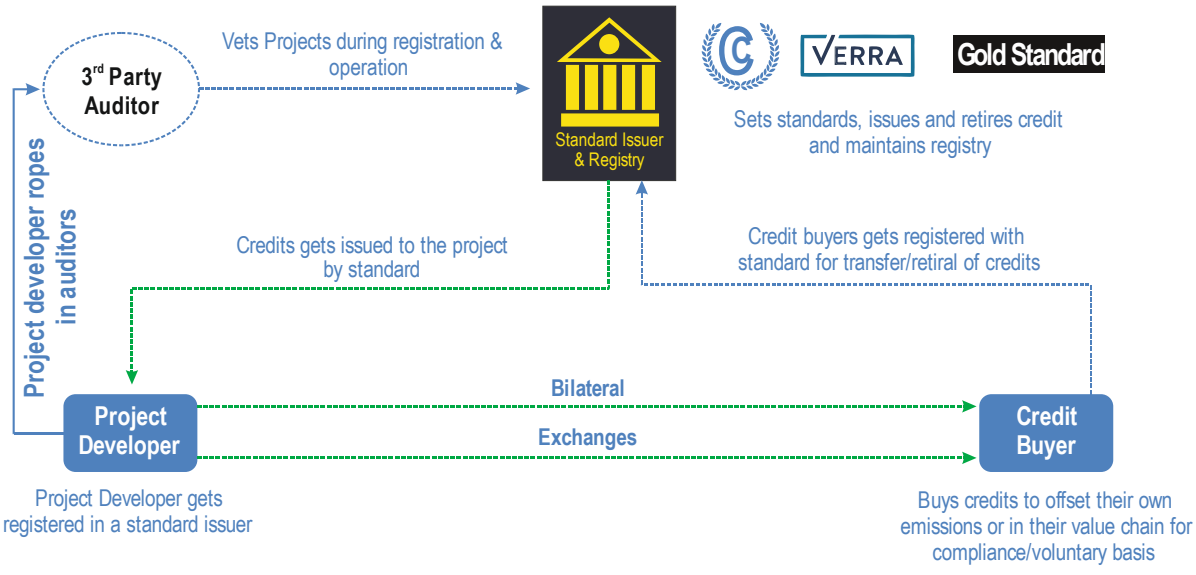
Historical Perspective

The evolution of Carbon Markets dates back to 1992 Rio Earth Summit when the threat of climate change was formally acknowledged. This summit led to incorporation of United Nations Framework convention on climate change (UNFCCC). This Summit obligated developed countries to monitor and report activities undertaken towards GHG reduction, though this was not binding in nature. Subsequently, the next big development was signing of Kyoto Protocol in 1997 & its ratification in 2005. Unlike the Rio earth summit, the Kyoto Protocol put a binding clause on developed nations to cut emissions. For developing nations, this was voluntary in nature. Kyoto protocol had two commitment periods for emission reduction. In the first commitment period (2008 to 2012), the targeted GHG reduction was 5% by 2012 vis-à-vis 1995 emission level. In the second commitment period (2013-2020), the target was further increased to GHG emission reduction by 18% by 2020 vis-à-vis 1990 emission level. A landmark development during Kyoto protocol was development of market-based mechanism for trading of carbon emission allowances and carbon credits. Finally, the Paris Agreement effective from year 2020

is in place which has been ratified by more than 197 countries. The Paris Agreement works on the principle of common but differentiated responsibilities for developed and developing nations based on the shared objective but actions corresponding to individual nation's mandate. The targeted emission reduction called Nationally Determined Contributions (NDC) is declared by each signatory themselves but the action and reporting on the declared NDC is binding for all the signatories. The Paris Agreement also puts in place a global cooperation among nations to decarbonise the emission through global carbon market-based mechanisms.

Ecosystem of Carbon Markets

Carbon markets are basically a marketplace where trading of carbon credits or emission attributes takes place. A carbon credit is a tradable permit or certificate which represents avoidance/reduction of emission of 1 ton of CO2 or an equivalent of other greenhouse gases. Carbon credits are purchased to offset the unavoidable emission. Apart of CO2, other GHG gases are Methane, Nitrous Oxide, PFC, HFC, SF6.



Schematic diagram representing the working of carbon credit ecosystem.

In the carbon credit ecosystem, the standard issuer sets the guidelines & protocols to be adhered for getting registered and get issuance of carbon credits. Each standard holds and maintains its registry as well. Some of the major standard & registries in the world are CDM, Verra (Verified Carbon Standard, VCS) and Gold Standard (GS) etc. The credit issued by a given standard is maintained by its registry itself and cannot be transferred to other carbon registry. For example, carbon credit issued by VERRA (called as Verified carbon units) is stored at VERRA registry and can't be transferred to the Impact registry operated by Gold Standard. The credits are issued to the projects based on detailed scrutiny by 3rd party auditor. Once the credits are issued to the project, the project developer can either sell the credit to the buyer or self-consume/burn it in the registry.

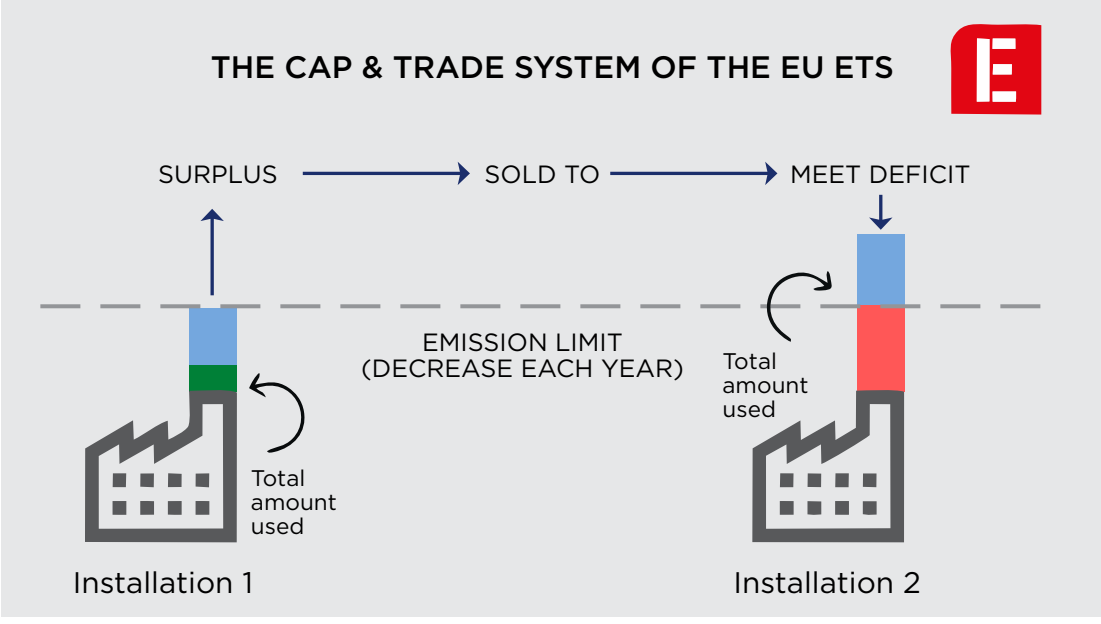
Types of Carbon Markets

There are two types of carbon markets: Compliance Carbon Markets and Voluntary Carbon Markets. Each of these market types have been discussed below.

(a) Compliance Carbon Markets

Compliance carbon markets are a result of government driven carbon emission reduction program for the regulated or identified industry types or installations. The compliance carbon market is regulated by mandatory national or regional or international carbon reduction regimes. The compliance markets evolved post Kyoto Protocol. The three main market-based mechanisms in compliance markets are:

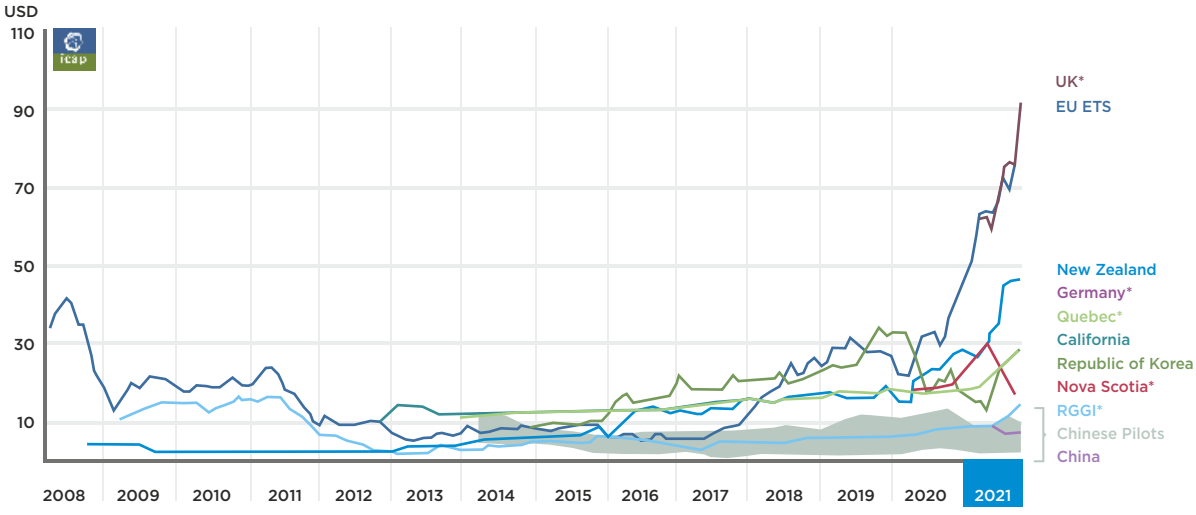
- **Emission Trading Scheme (ETS):** ETS works on Cap & Trade model in which a Cap on total emission by the selected installations is fixed and emission allowances (1 Emission Allowance = 1 CO2 eq.) are issued to these entities. If an entity emits more than the allowed quantum (i.e., Cap) of emission allowances it can buy the EA from other obligated entities which emits less than the allowed quantum of EA (Trade). At the end of every year, each obligated entity must surrender enough emission allowances (allotted & purchased from other covered entities) against their total emissions quantum. In case of shortfall of emission allowances vis-à-vis their emission, a penalty (~ $80-$100) is imposed on those entities. Major ETS programmes are EUETS (90% of the global compliance market), California ETS, Korea ETS etc.



Source: Investigate Europe

- **Clean Development Mechanism (CDM):** CDM operated under the framework of UNFCCC and offset projects under CDM were required to be set up in developing nations and the credits generated from these projects could be used to offset against the emission allowances in the compliance market.
- **Joint Implementation (JI):** JI is similar to CDM with the only difference that carbon offsets projects are required to be set up in developed nations only.

According to S&P Global report, the global compliance market grown to around $272 billion in 2020 and 90% of the compliance market was with the EU ETS which traded around 10.3 billion emission allowances in 2020. Further, the global compliance carbon market registered rapid growth in 2021 and stood at $851 billion. The price in EU ETS went up to $100 in 2021 which was almost double the price in 2020. This was driven by more ambitious climate goals of EU to reduce emission by 55% by 2030 vis-à-vis 1990 levels. Also, the prices on other ETS such as Korea increased from $21 to $30 and in New Zealand from $27 to $46.



Emission Trading Worldwide

Source: 2022 ICAP Report

Understanding Worlds First and the Biggest Compliance Carbon Market: EU ETS

The basic preamble of the compliance carbon market is carbon pricing instrument (CPI). Carbon pricing instruments are mandatory instruments used by governments to put an explicit price of carbon and make regulated entities pay for their emissions. There are two main types of compliance CPIs: emission trading systems (ETS) and carbon taxes. In ETS scheme, a cap is imposed on the total allowed emission and a penalty is imposed in case emission exceeds permissible limits. In carbon tax mechanism, a tax is imposed on the polluting fossil fuel or the GHG emission of regulated entities or a combination of both. Both these mechanisms are based on the principle of 'polluter pays'.

EU ETS is the oldest and biggest compliance carbon market, launched in 2005. In Phase 1 (2005-2007), EU ETS covered only power generators and energy intensive industries. A cap was set on the total permissible emission and the Emission Allowances (EA) were given for free to these entities. The penalty for non-compliance i.e., exceeding the allocated EA was set at €40.

In Phase 2 (2008-12), the cap was lowered, and the free allocation was reduced to 90%. This implied that 10% of the EA within the cap limit were auctioned and the regulated entities were required to bid for the 10% of EA. The penalty for non-compliance was increased to €100.

In Phase 3 (2012-2020), a single EU wide cap on emissions were put in place instead of nation-wide cap. Now, all the EA were to be allocated through auction only except some manufacturing and export-based industries gets free allocation. Even for manufacturing and export-based industries, free allocation shall be reduced to 70% by 2026.

The EA are auctioned by European Commission at EEX platform. The registry for the EU ETS got unified under single registry for all EU nations from 2012 onwards & it is managed by executive body of European Commission. As a part of stretched goal of EU to reduce its total emission by 55% (w.r.t.1990) by 2030, the cap shall be reduced at a faster rate in Phase 4 (2021-30) at 2.2% per year as compared to 1.74% during previous phases. The EU has decided to completely eliminate free allocation of EA for all sectors from 2030 onwards.

(b) Voluntary Carbon Markets

Voluntary carbon markets are not mandated or regulated by government norms. This market is mainly driven by voluntary buyers such as corporates with climate goals to offset their emissions. The projects are developed, and credits are issued to the projects as per the standard under which the project is registered. The major standards in voluntary carbon space are:

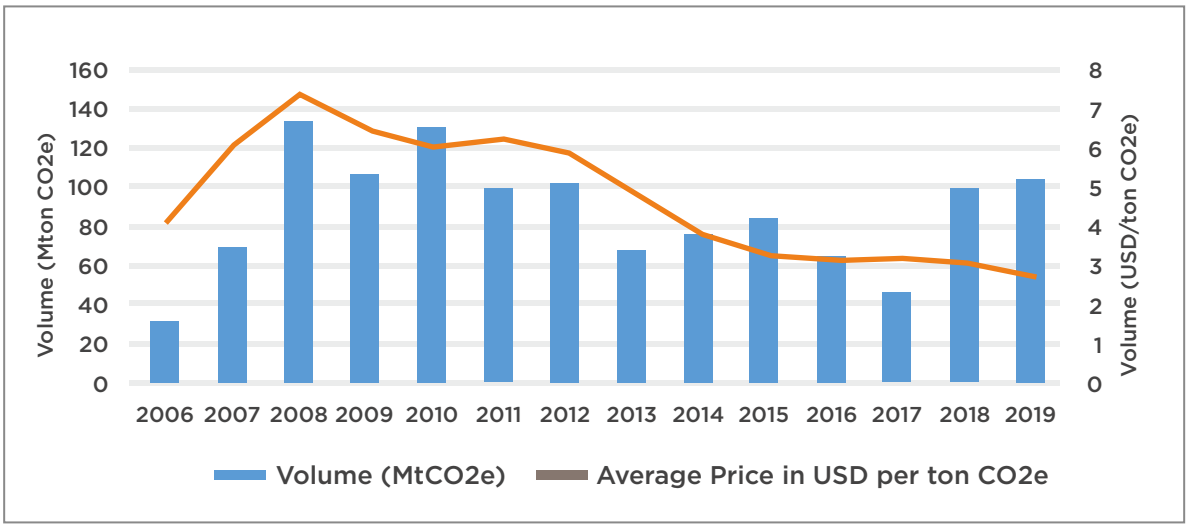
- VERRA often referred as Verified Carbon Standard (VCS). The carbon credits issued by VCS is called as Verified Carbon Unit (VCU).
- Gold Standard (GS). The carbon credits issued by GS is called as Verified Emission Reduction (VERs).

VERRA and GS together commands more than 80% of credits being issued by voluntary standards. These voluntary carbon standards are based on four core principle for acceptance and issuance of credits from the projects:

- **Real:** There will be evidence that the projects actually remove or prevents emissions
- **Additional:** The emission reduction would not have occurred anyway, without those projects
- **Measurable:** The volume of emission reduction can accurately be measured
- **Verifiable:** A neutral, 3rd party auditor has verified the emissions reductions

Although, voluntary carbon market is in place since 2000, it has gained traction in recent times and over last 3 years (2019 to 2021), the CAGR of voluntary carbon trading has been more than 30%. In 2021, the market size of voluntary carbon trading reached to $1 billion. The major buyers in voluntary carbon markets are financial services companies, airlines, chemicals, refineries etc. Carbon credits are issued to the projects as per project categories and price of the credits varies both across the categories, across the standards (under which the project is registered) and across the geographies. Currently, most of the credits in voluntary carbon space belongs to renewable energy generation. However, Verra and Gold Standard have stopped registering renewable projects from developed and developing nations as they don't find the element of "Additionality" in RE projects due to cheaper cost of generation and widely available renewable energy technologies in these nations. Verra and Gold standard however will accept renewable energy projects in least developed nations. Recently, Global Carbon Council (GCC) based out of Gulf region accepts registration and issuance of carbon credits from new renewable energy projects.

The majority of selling of credits happens through bilateral mode and some volume through voluntary carbon exchanges. In case of bilateral trade of carbon credits, both buyer and seller must be connected with the same registry for transfer of credit post transactions. However, for trade of carbon credits through voluntary carbon exchanges, the buyer need not have an account in the registry as the voluntary carbon exchange opens its accounts with all major registries. Post the trade of carbon credits, the voluntary carbon exchange ensures transfer of ownership takes place from sellers to buyers in the registry (through voluntary carbon exchange's registry account with the concerned registry. Going forward, the role of voluntary carbon market is expected to grow further as some of compliance markets are also now allowing the use of voluntary carbon credits. For example, California's ETS allows use of voluntary carbon credits and CORSIA (Carbon Offsetting & Reduction Scheme for International Aviation) allows certain voluntary credits. Recently, the Swedish Government entered into partnership with Gold Standard to allow and use its credit for acquisition of international credits under Article 6.



Historical trends of voluntary carbon market
(ref: Ecosystem Marketplace)

The table below shows trends of volume and prices of different categories of carbon credits over last three years:

	2019			2020			2021 (till Aug)		
Category	**Volume (Mtco2)**	**Price ($/Ton)**	**Market Size Million USD**	**Volume (Mtco2)**	**Price ($/Ton)**	**Market Size Million USD**	**Volume (Mtco2)**	**Price ($/Ton)**	**Market Size Million USD**
Waste Disposal	7.3	2.5	17.9	8.3	2.8	23.2	2.7	3.9	10.5
Transportation	0.4	1.7	0.7	1.1	0.6	0.7	2.1	1.0	2.1
Renewable Energy	42.4	1.4	60.2	80.3	0.9	72.3	80.0	1.1	88.0
Household devices	6.4	3.8	24.6	3.5	5.0	17.5	1.8	5.8	10.4
Forestry & Land use	36.7	4.3	158.9	48.1	5.6	269.4	115.0	4.7	540.5
Energy Efficiency & Fuel switching	3.1	3.9	12.0	31.4	1.0	31.4	16.0	1.6	25.6
Chemical processes/ industrial manufacturing	4.1	1.9	7.8	1.3	1.9	2.5	1.1	3.2	3.5
Agriculture	-	-	-	0.3	9.2	2.8	3.4	1.4	4.8
Total	**100.4**		**282.0**	**174.3**		**419.7**	**222.1**		**685.5**
Wt. Avg. Price of Credit (All Categories)		**2.8**			**2.4**			**3.1**	

Table: Recent trends in voluntary carbon markets
(ref: Ecosystem Marketplace)

The voluntary carbon market is expected to grow at around same rate over next 5-7 years driven by strong demand from airlines as mandated by International Civil Aviation Organization (ICAO's) led scheme CORSIA. Further, under programmes such as Climate Action 100+, 111 out of 167 companies representing two-third of the world's heaviest emitters have set a target to become net zero by 2030. Also, the total number of companies with net zero target by 2050 increased from 500 in 2019 to 1000 in 2020. According to a report published by CII & GIZ, as on Jan 2022, there are 921 projects from India under Verra VCS and Gold Standard. As per the conservative estimates, there is a potential to generate 132.6 million credits from Verra VCS and 17.4 million credits from GS over next decade.

Further, with acceptance and convergence of voluntary market with the compliance markets and use of voluntary credits for transactions under Article 6, it is expected that by 2030, the voluntary carbon market size would increase to around $100 billion.

Developments in Carbon Space

Developments in Carbon Space in India

There is an increasing traction in India towards development of compliance carbon market. As per the Draft National Carbon Market, consultation paper floated by BEE, a roadmap has been laid towards establishing a national carbon market in phased manner:

- **Phase 1 (Short term):** The Phase 1 shall aim to create demand in the carbon market. This is expected by creating liquidity in the carbon market through fungibility of the EScerts and RECs into carbon credits. In sell side, the outstanding EScerts along with RECs will create liquidity which shall also be fungible with carbon credits. On buyers' side, voluntary participation of corporate buyers, airlines industry (CORSIA) shall be allowed along with the designated entities covered in PAT scheme and obligated entities having RPO compliance.
- **Phase 2 (Medium term to long term):** Phase 2 shall focus on increasing supply in the carbon market through approval of new projects under internationally approved standard. This is likely to be a revamped version of CDM model. Finally cap & trade system shall be implemented and to begin with, power sector and energy intensive sectors is expected to be included.

Developments Post CoP 26-Glasgow Summit

One of the landmark achievements of Paris Agreement is Article 6 provisions which provides for cooperative approaches among the signatories to enhance climate actions and reduce marginal cost of abatement. Article 6.2 of the Paris Agreement provides for bilateral cooperative agreements between the countries and Article 6.4 provides for centralised mechanism wherein countries can agree to trade emission reductions or mitigation outcomes to meet their NDC targets as long as a robust accounting mechanism is put in place to avoid double counting. To ensure the credibility of the voluntary credits, various bodies such as UNFCCC's advisory body and Integrity council for voluntary carbon markets etc. are working to assess the standards and make the ecosystem more robust. UNFCCC is also working to establish a Centralised Accounting and Recording Platform (CARP) which shall be central repository for tracking and accounting. Similarly for transaction of Internationally transferred mitigation outcomes (ITMOs) under Article 6.2 and transfer of credits under Article 6.4, there will be a requirement of robust mechanism to ensure that corresponding adjustment has been done and the same shall not be included in the NDC of the credit exporting nations. Further, it is worth noting that though the provisions of Article 6.2 and Article 6.4 exists for trade of carbon credits, the host country shall reserve the right to permit or restrict the export of any/all carbon credits. Looking at these developments and to address the issues of double counting, leading Registries are planning to introduce two types of credits: Authorised/adjusted credits (eligible to be claimed in compliance markets or NDC) and Unauthorised/non-adjusted credits for voluntary purposes.

Conclusion & Way Forward

In line with the existing ETS operation in EU, Korea, and China (recently launched), India's compliance market could also adopt the principle of capping the emission level from the energy intensive industries (to begin with) and allowing trading of the allowances in the compliance market. A framework needs to be created to set the sector specific caps & reduction trajectories, nominating nodal agencies for monitoring, review & verification, and maintaining registry. Early commencement of compliance carbon market shall prepare Indian industries to meet the emission norms and become compliant of requirements to export in global markets, especially after restrictions such as EU's carbon border adjustment mechanisms. Further, clarity of the policy and sector specific reduction targets shall give visibility to Indian industries to pro-actively channelise their CAPEX in line with emission norms. It is expected that the Energy Conservation (Amendment) Bill 2022 shall create required regulatory framework for Carbon Trading in India. Thus, a well-functioning compliance carbon market in India could act as a robust mechanism by giving efficient market signals for climate friendly investments in a transparent manner and help India to meet climate goals.

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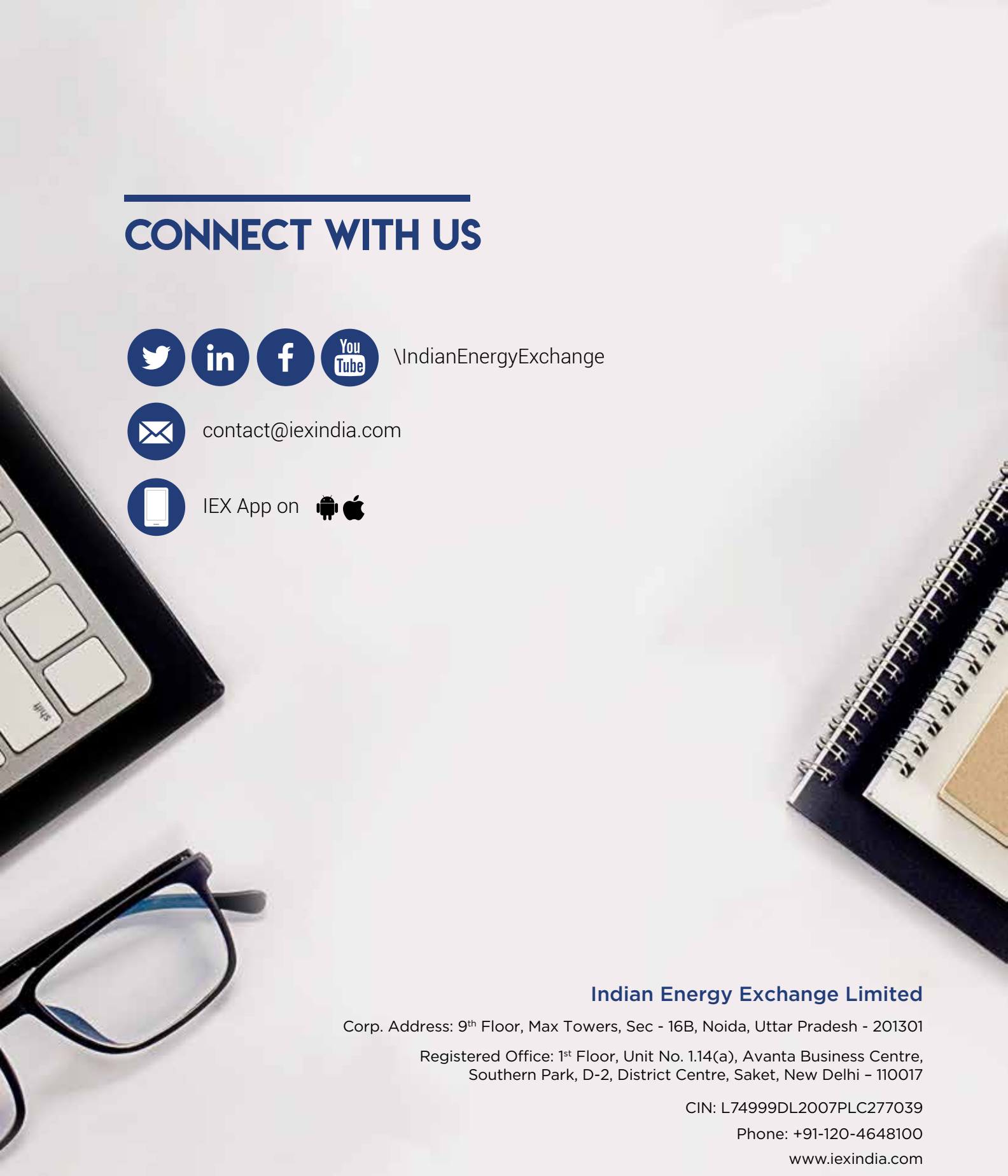

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