

- vi. **Total number of energy savings issued in the cycle** = Energy saving certificate to be issued after year 1 + Energy saving certificate to be issued after year 2 + Energy saving certificate to be issued in target year

Formula for approach 2:

- i. **Energy saving certificate to be issued** = {Specific energy consumption target notified for the year - specific energy consumption achieved} X production in baseline year

Important considerations for approach 1 and 2:

- Estimation of ESCerts to be issued is less complex in approach 2 compared with approach 1
- Understanding the energy saving potential in various PAT sectors through potential estimation studies and consultation with technical committees requires a considerable time. In this regard, approach 1 seems more pragmatic.
- Identification and implementation of energy conservation measures in DCs in some case may require more than 1-year time, hence in such cases, the DCs may opt for purchase ESCerts to comply with provided target. This may have impact on trading activity in ESCerts market

Present capacity for handling administration of yearly PAT compliance cycle

Capacity of undertaking PAT activities such as baseline, M & V, and target setting, on yearly basis, has already been developed through execution of PAT four rolling cycles. To expedite the baseline and M & V activities, following suggestions may be considered:

- Award of M & V contracts, which is presently being done by DCs, may be undertaken by BEE or any other central agency to prevent delays and conflict of interest
- Reports related to baseline, M & V and other documentation required from DCs and AEE, may be prepared in digital form directly over PAT NET portal using digital keys.

3.3 Participation of voluntary buyers and sellers (Short term: 1 to 3 years)

As per present PAT rules, only designated consumer with compliance targets can participate in ESCerts trading over exchanges (IEX/PXIL). Once fungibility option of ESCerts to emission reduction units (ERU) is available, entities meeting minimum eligibility criteria, defined by market regulator, may participate in voluntary carbon market. The minimum eligibility criteria for voluntary buyer and seller may involve:

- Financial capacity and background checks to prevent default, corruption, and money laundering.
- Registration of entity with BEE
- Registration of emission reduction with project with designated authority (in case a new domestic project is getting registered for issuance in proposed voluntary carbon market)
- Verification and validation of emission reduction by AEA (for project developer having valid CERs issued under CDM regime or for issuance under voluntary carbon market regime)
- Registration with registry and exchanges

3.4 Target and compliance in emission intensity (medium term: 3 to 5 years)

With commitments under NDC targeting reduction of emission intensity⁷ of GDP by 33 – 35% upto 2030 from 2005 level and global community focus on emission reduction, it seems practical to move to emission intensity-based targets for designated consumers, as it represents almost 50% of primary energy consumption of India.

⁷ NDC targets are expected to be revised soon

With present PAT regime, there is a fully functional mechanism available, with detailed rules for estimating DC specific targets, normalisation factor, issuance, trading, and other relevant regulations. Hence, it is suggested to keep the basic structure and underlying mechanism same, while updating forms, proforma to derive targets in emission intensity. Formula for emission intensity reduction and issuance of ERUs is provided below

Emission intensity in baseline year (tonne of CO₂ equivalent per tonne of production) = Annual emission in baseline year (Scope 1 and scope2) ÷ production in baseline year

No. of emission reduction units issuance = {Emission intensity in notified for target year – Emission intensity achieved in target year} X production in baseline year

Emission intensity reduction (Tonne of CO₂ equivalent per tonne of product) = Emission intensity baseline year – Emission intensity achieved in target year

Annual Emission reduction for specific DC (Tonne of CO₂ equivalent) = Emission intensity reduction X production of baseline year.

Applicability and potential way forward

For PAT cycle planned after 3 – 5 years, the targets may be provided in emission intensity reduction instead of energy intensity. In new system, BEE may consider emission intensity of the production as the target parameter. The emission intensity may be estimated by dividing total emission of the factory (scope 1 and scope 2) by total production. GHG accounting sheets, for inclusion in sector proforma may be prepared, as per the energy and non-energy use of fossil fuels, electricity and other GHG emission sources.

Annexure - 1

Overview of select compliance markets

1. European Union – Emissions Trading System (EU-ETS)

The EU Emissions Trading System (EU ETS) is a 'cap and trade' system. The system allows trading of emission allowances so that the total emissions stays within the cap and the least-cost measures can be taken up to reduce emissions. The EU ETS is a major tool of the European Union in its efforts to meet emissions reductions targets now and into the future. The trading approach helps to combat climate change in a cost-effective and economically efficient manner. The system was first introduced in 2005 and has undergone several changes since then. The implementation of the system has been divided up into distinct trading periods over time, known as phases:

	Phase 1 (2005 – 2007)	Phase 2 (2008 – 2012)	Phase 3 (2013 – 2020)
Sectors	<ul style="list-style-type: none"> Power generation Energy intensive industries 	<ul style="list-style-type: none"> Aviation from 2012 onwards 	<ul style="list-style-type: none"> Further energy intensive industries
Geographic Scope	<ul style="list-style-type: none"> EU – 27 countries 	<ul style="list-style-type: none"> Norway Iceland Liechtenstein 	<ul style="list-style-type: none"> Croatia
Green house Gases	<ul style="list-style-type: none"> Carbon Dioxide (CO₂) 	<ul style="list-style-type: none"> Nitrogen Dioxide (N₂O) 	<ul style="list-style-type: none"> Perfluorocarbons (PFCs)

Figure 14: EU-ETS scope and phases

How does the EU-ETS work?

Within the cap, installations buy or receive emissions allowances, which they can trade with one another as needed. The limit on the total number of allowances available ensures that they have a value. After each year, an installation must surrender enough allowances to cover fully its emissions, otherwise heavy fines are imposed. If an installation reduces its emissions, it can keep the spare allowances to cover its future needs or else sell them to another installation that is short of allowances. Allowance were provided free in initial phase and gradually the installation must purchase portion of allowances. The overall working of EU-ETS is shown below:

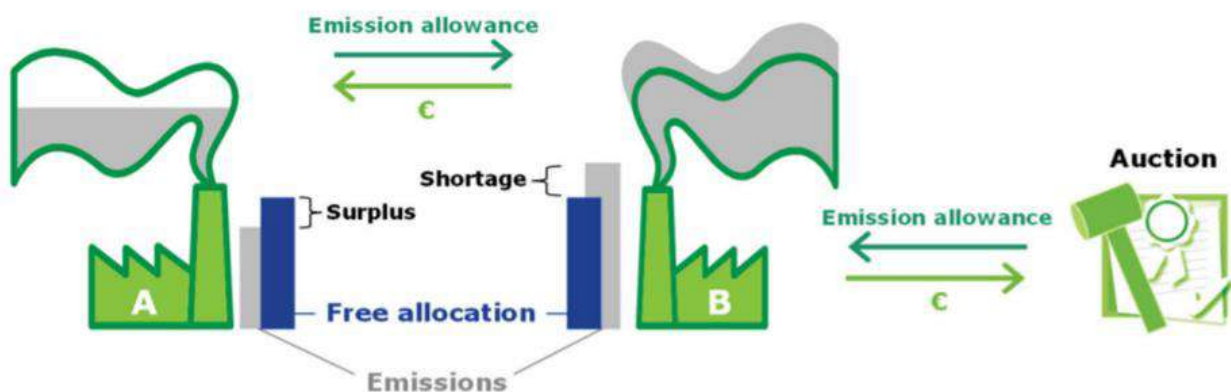


Figure 15: Emissions trading in the EU-ETS

What is the EU-ETS compliance cycle?

Operators of industrial installations and aircraft operators are required to monitor and report their annual emissions to their Competent Authority (CA). This procedure can be summarised in an annual compliance cycle:



Figure 16: EU-ETS compliance cycle

What are the highlights of the previous phases?

- Phase-1 was a trial phase in which Individual countries defined cap and sum of it become the EU CAP. This initial phase was able to establish a price for EUAs, free trade throughout the EU and the infrastructure for monitoring, reporting and verifying (MRV) actual emissions from the covered installations. Approximately 200 million tonnes of CO₂ or 3% of total verified emissions were reduced due to the ETS at nominal transaction costs⁸.
- Phase-2: Aviation was included as a sector in this phase. In this phase Iceland, Norway and Liechtenstein joined the EU ETS and the scope was amended to include nitrous oxide from nitric acid production from several Member States. Businesses were allowed to use credits from the Kyoto Protocol's Clean Development Mechanism (CDM) and Joint Implementation (JI) leading to a total of 1.4 billion tons of CO₂ equivalent credits on the market (with the exception of those for nuclear facilities, agricultural and forestry activities).
- Phase-3: EU defined the overall cap, and it is then allocated to countries. Liner reduction at 1.74% annually on overall emission allowance at EU level as well as concept of auction and free reserve included. Carbon leakage safeguard included to prevent production transfer to countries with laxer climate policies

Benefits of auctioning?

It Improves prudence while estimating need of allowance for a specific year. Encourages installations to invest in low carbon technologies to avoid purchase through auction

⁸ International Emissions Trading Association: The EU Emissions Trading System

What has been the price range of allowances under EU-ETS?

- Phase-1: Initially the price was in range of 25 – 30 euro per allowance. Since, option of banking was not available in phase 1, oversupply led to price fall.
- Phase-2: Banking allowed which stabilized price in 20 – 25-euro range. Economic recession effected demand
- Phase-3: Over supply of allowances in the market led lower price. In last 3 years the price is on the rise has reached 54 euro due to stringent allowance reduction planned for 2021 – 2030 period

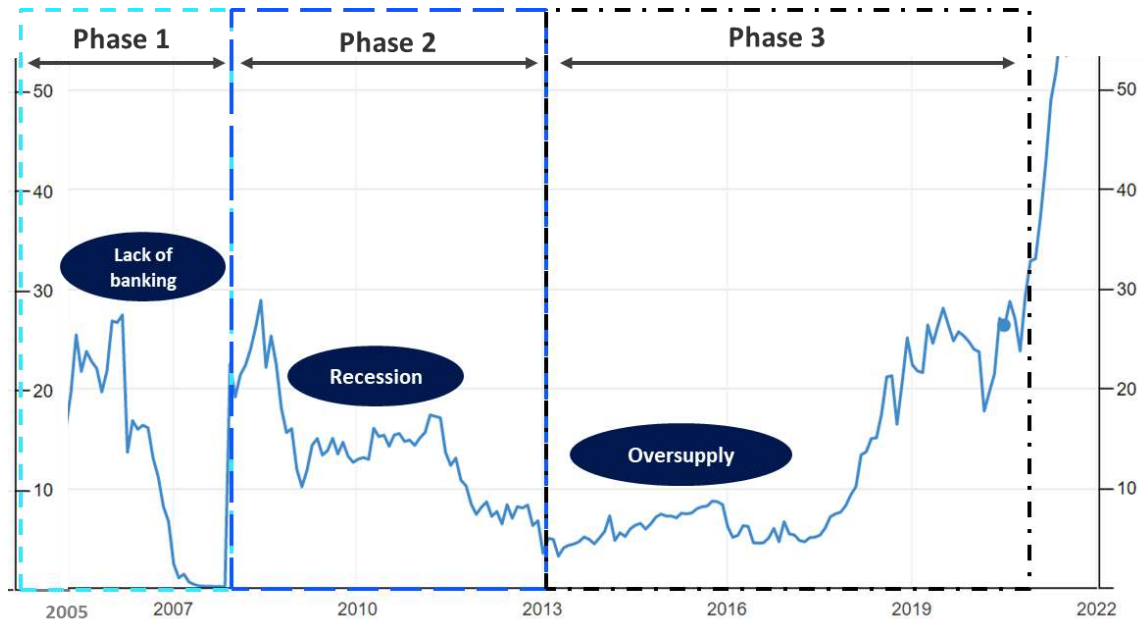


Figure 17: Price range under EU-ETS (Phase-1,2,3)

What have been the learnings from EU-ETS?

- The first important lesson is that a cap-and trade system like EU ETS is very helpful in guaranteeing a credible and binding reduction of emissions within the ETS sectors. The gradual yearly reduction of allowances is a key element to deliver its promised contribution to a long-run deep decarbonization within EU ETS, whereas no such guarantee would be provided by using a carbon tax instead.
- As the economic and sovereign debt crisis hit European economies, emissions dropped as less cement was produced, less ore smelted, less oil refined and less power produced throughout Europe. This amounted to a drastic reduction in demand for emission allowances. On the other hand, supply of allowances remained unchanged as auctioned volumes were set in advance and companies received their predetermined free allocations in spite of lower production. To deal with this, the following steps were taken: Backloading of auction, increase emission reduction target, Retiring of allowance, Expansion of scope, Limiting international import and Option of strategic reserve for price management
- EU ETS has been an important cross-cutting tool for pricing carbon from the use of fossil fuels within the EU. Its carbon price "base" covers most emissions within the electricity sector and in energy-intensive industry

2. China National ETS

China’s national ETS started operating in 2021, bringing the world’s largest ETS online after three years of preparation since the political launch. In early January 2021, the Chinese Ministry of Ecology and Environment (MEE) published key ETS policy documents, along with an announcement that regulated entities will need to surrender allowances pertaining to their 2019-2020 emissions in 2021. In mid-2021 the Chinese national ETS commenced trading on the trading platform operated by the Shanghai Environment and Energy Exchange (SEEE)

China ETS Snapshot

Table 3: China national ETS parameters

ETS Parameters	Status
Sectors and Threshold	Power sector (including combined heat and power, as well as captive power plants of other sectors). Compliance obligations are currently limited The scope is expected to be gradually expanded to cover seven other sectors in addition to power: petrochemical, chemical, building materials, steel, nonferrous metals, paper, and domestic aviation. There is no specific timeline for this expansion
Number of entities	The Chinese regional ETS pilots covered power sector entities, which may also fall under the national ETS. These entities are transitioning into the national market. It is estimated that 2225 power sector entities are part of the ETS in 2021⁹.
Compliance period	One year (1 January to 31 December). Nevertheless, entities are expected to surrender allowances in 2021 for the years 2019 and 2020.
GHGs covered	CO ₂
Allocation	Free allocation: Benchmarking is used as the main allocation method, with four distinct benchmarks: conventional coal plants below 300 MW; conventional coal plants above 300 MW; unconventional coal; and natural gas Currently, allocation is to take place mainly through free allocation, but the National Measures clarify that auctioning may be introduced at a later point in time

China's seven years of experience in emissions trading (The Beijing pilot started in late 2013) provide an important case study for other emerging economies in Asia and the Americas of how a carbon price with wide coverage can be introduced in a way that is sensitive to the local circumstances of a developing economy while limiting carbon emissions.

What have been the learnings from China’s ETS journey, from pilot to national implementation?

- During the pilot ETS phase, and going into the national system, China has developed a compromise solution in which large electricity consumers, such as industry as well as public and private institutions, are provided with an emissions cap and allowance allocation in the carbon market in relation to their indirect electricity consumption. While the lack of complete cost pass-through means that efficiency incentives are downstream, it does help to protect consumers from the cost impact.
- They have engaged industry representatives throughout in a number of ways. Companies and sectoral associations sit on committees together with think tanks, government representatives and policy design advisers.
- Every ETS needs to be designed with regard to other measures which may also lead to emissions reduction. Energy efficiency standards, mandatory closure of facilities, pollution

⁹ International Carbon Action Partnership, China National ETS highlight, 2021

mitigation policies and economic slow-down can all impact demand within the carbon market by enabling companies to meet their cap more easily without buying ETS credits. In China, the effects of a range of policies have informed the design of its ETS, in particular the reform of its power sector. By planning to start operation of its national ETS exclusively in the power sector, the Chinese government has opened the opportunity to carefully consider how to coordinate between policies.

3. Korea Emissions Trading System (K-ETS)

The Korea Emissions Trading Scheme (KETS) caps greenhouse gas (GHG) emissions from participants within the scheme and involves the issuance of a corresponding number of emission allowances, where each allowance represents 1 ton of carbon dioxide equivalent (tCO₂e) permitted to be emitted. Participants must measure their annual emissions and surrender allowances to cover their emission responsibility. Participants that emit less than their allocation can sell their excess allowances, while those who do not have enough allowances to cover their annual emissions need to buy them. This creates the direct economic incentive for emission reduction. At the same time, the cap limits the GHG reductions to target levels.

Korea ETS snapshot

Table 4: Korea ETS snapshot

ETS Parameters	Status
Sectors and Threshold	The K-ETS covers the following six sectors: heat and power, industry, buildings, transportation, waste sector, and the public sector. The transport sector (freight, rail, passenger, and shipping) and construction industries have been brought into the system’s scope, increasing the number of subsectors covered to 69
Number of entities	685
Compliance period	One year. Entities need to surrender allowances for the previous emissions year by end of June
GHGs covered	CO ₂ , CH ₄ , N ₂ O, PFCs, HFCs, SF ₆
Allocation	Free Allocation: Less than 90% of allocation to entities in sub-sectors subject to auctioning; 100% for EITE sectors. The share of sector-specific benchmarking is to reach 60% and has been expanded to a total of 12 sectors: grey clinker, oil refinery, domestic aviation, waste, industrial parks, electricity generation, and district heating/cooling, with the addition of steel, petrochemical, buildings, paper, and wood processing. Auctioning: At least 10% of allocation to entities in sub-sectors subject to auctioning. Entities from 41 subsectors, which excludes EITE sectors, can participate in auctions.

What have been the learnings from Korea Emissions Trading System (K-ETS)?

- The unrestricted banking of allowances in the Republic of Korea (ROK) resulted in most of its participants banking excess allowances for future periods. For example, allowances unused in Phase I were kept for Phase II compliance when targets are more stringent. When this is done to a great extent across a system, it can lead to delayed abatement. A clear expectation of future abatement needs can help address this¹⁰.
- An extensive preparatory period may be required. With an ETS being a relatively complex policy instrument that requires significant internal capacity from its participants, its introduction requires an extensive preparatory period for the participants to familiarize themselves with the rules and prepare for compliance actions. In ROK, the first master plan and allocation plan of the ROK were published in the fourth quarter of 2014, with the system launch scheduled about 2 months later. With such a limited time for preparation, many participants were not fully prepared to join the new system.

¹⁰ The Korea emissions trading scheme—Challenges and Emerging Opportunities, ADB, November 2018

- Stakeholder engagement is crucial for successful ETS introduction. In a developing economy that has significant reliance on energy-intensive industries, the introduction of a carbon pricing instrument may appear to be a very sensitive issue that is likely to face strong opposition from the national industries. It took the ROK over 2 years to gain agreement from the industry to launch the KETS. Going forward, stakeholder engagement methods should be incorporated for introduction of major changes of the system. Public hearings and industry consultations continue to be frequently organized to provide support for KETS participants

Voluntary markets - Overview

The voluntary carbon market was created outside of governmental regulatory schemes by firms and individuals voluntarily buying carbon offsets to reduce their greenhouse gas (GHG) emissions for learning, image management, or regulation anticipation purposes¹¹. The emergence of the voluntary market can also lay the basis for building national capacity in carbon markets in countries whose climate policies may have yet to establish carbon market schemes. While from an environmental viewpoint voluntary markets cannot be a replacement for compliance markets, they can be an important, if small, complement to a compliance market. Voluntary markets can provide an early pre-compliance arena in which to test and develop systems needed to transition to a compliance market.

Recent demand and prices for voluntary carbon credits

Demand for voluntary carbon credits has been increasing rapidly in recent years, doubling over the last three to four years, reaching 95MtCO₂e in 2020¹². Demand has increased for all credit types, but especially Nature Based Solutions.

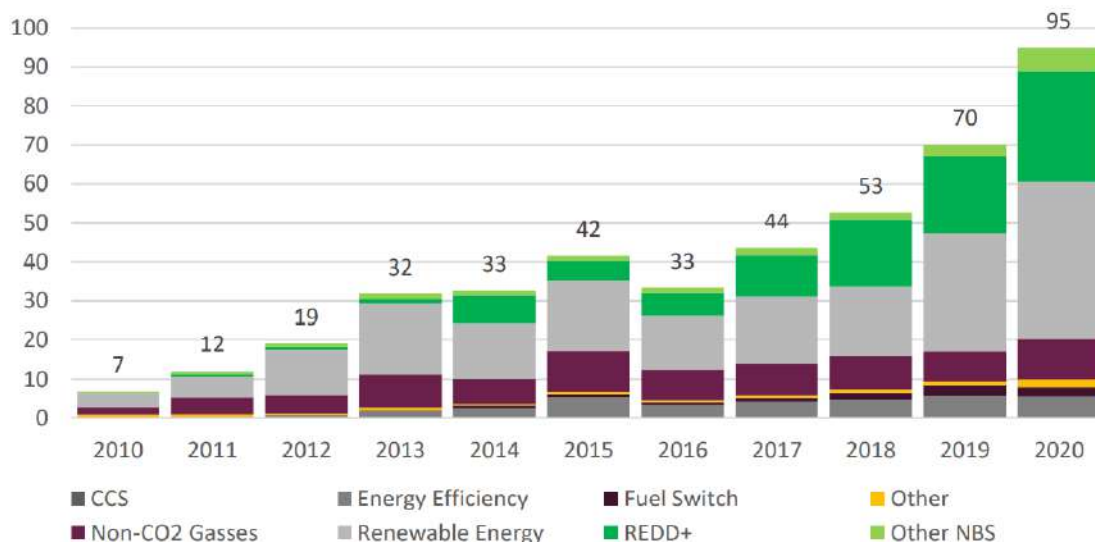


Figure 18: Demand for voluntarily carbon credits (MtCO₂e)

Carbon credits are used by a wide variety of sectors. The figure below shows the number of carbon credits retired by firms in different sectors in 2019. The source of data is different from the chart above, and not as comprehensive, capturing 70MtCO₂e out of a total of 90MtCO₂e, but gives a good representation by sector.

Firms in the financial services sector were the largest users of carbon credits in 2019 accounting for a quarter of all credits retired in the year. This was followed by chemicals and petrochemicals (including oil and gas) at 20%. All other sectors account for less than 10% of carbon credit retirements¹³.

¹¹ Bellassen et al., 2007

¹² Trove Research, Link: <http://www.trove-intelligence.com/>, accessed: 18th October, 2021

¹³ Trove Intelligence analysis, 2021, CDP 2020. "Chemical and Petrochem" includes oil and gas companies

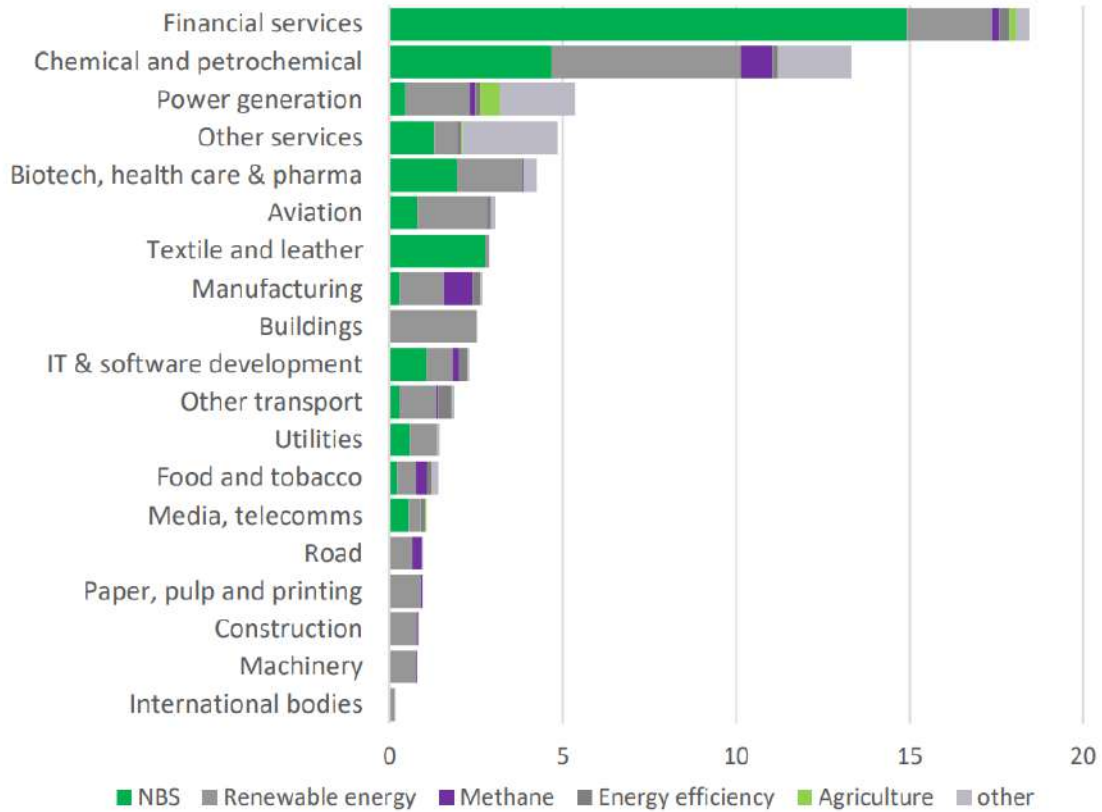


Figure 19: Demand for voluntarily carbon credits by sector 2019 (MtcO2e) (total volume)

Prices for voluntary carbon credits vary considerably according to the project type, its age (vintage), the size of the transaction and the standard (e.g. Verra, Gold Standard, CAR or ACR) to which it is accredited. Prices can range from under \$1/tCO₂e for older projects with fewer verifiable co-benefits, to over \$20/tCO₂e for projects with unique features and specific co-benefits, such as biodiversity and support for indigenous people. The figure below shows a summary of average prices in 2019 for credits projects in renewable energy, REDD+/forestry & land use, non-CO₂ gases/methane, energy efficiency and other NBS/waste disposal.

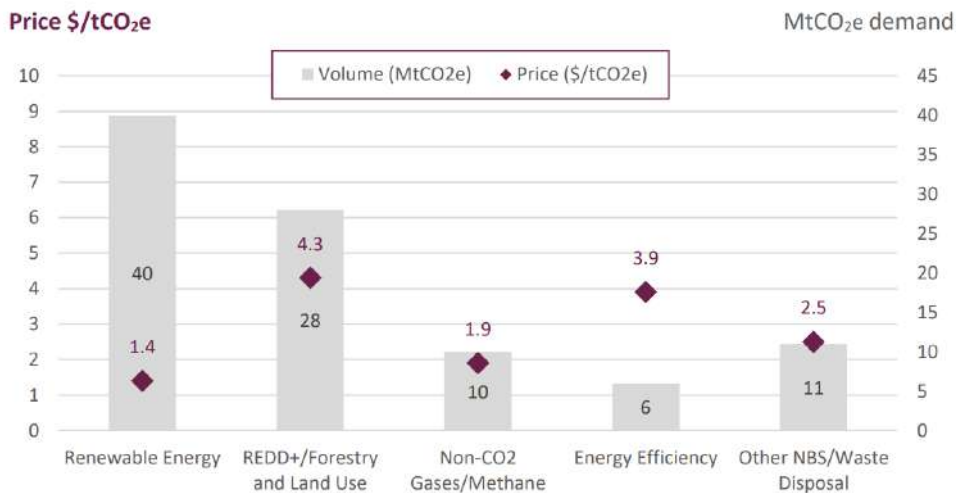


Figure 20: Voluntary carbon credit prices and demand 2019 by project type (average of wholesale and retail prices)

Voluntary Carbon Markets Functioning and Active Players

The VCM market worldwide currently involve the below-mentioned players over the entire value chain. Apart from the above-mentioned entities, National Climate Solutions Alliance, World Economic Forum (WEF) and World Business Council for Sustainable Development (WBCSD) act as guidance entities across the entire value chain

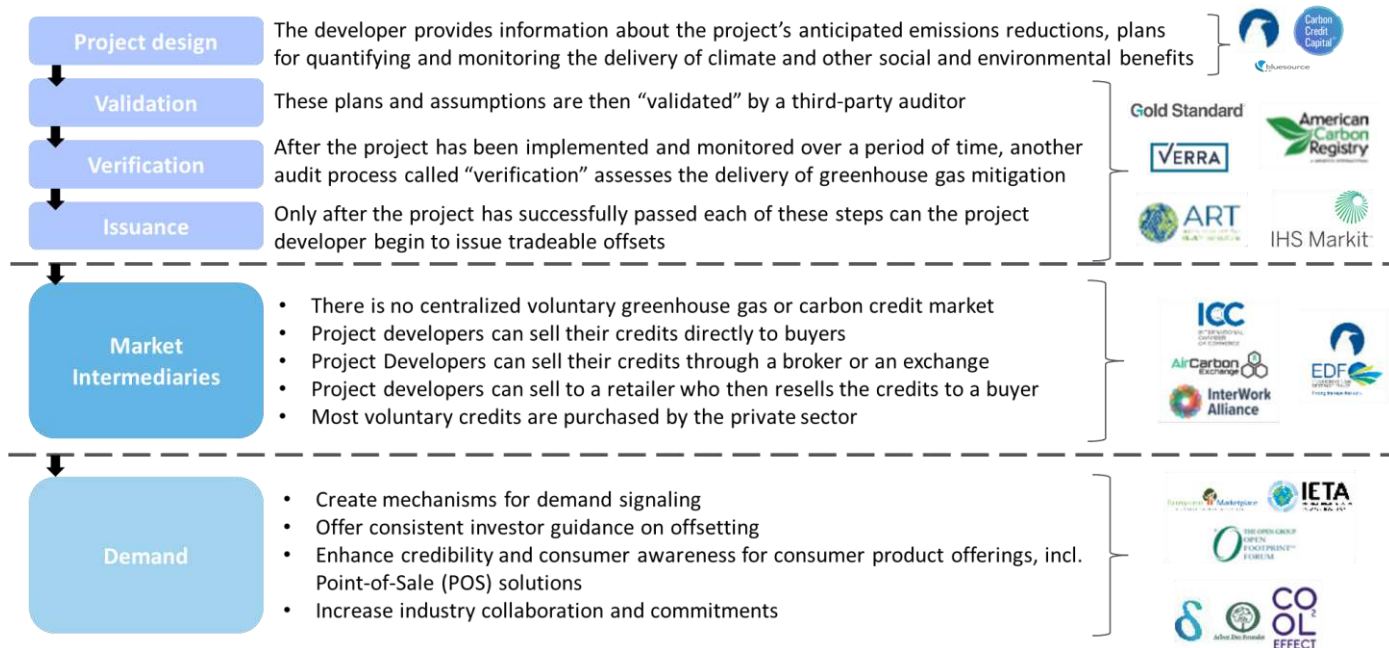
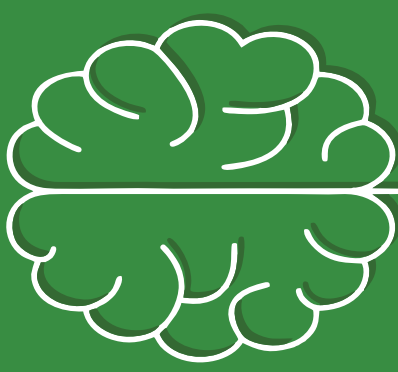


Figure 21 Voluntary carbon market value chain

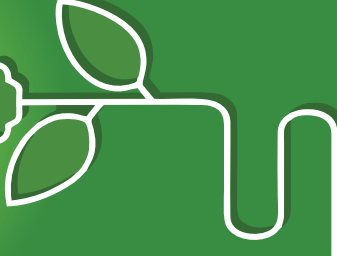


SAVING ELECTRICITY IS MORE THAN SAVING MONEY

It saves Environment

It reduces Carbon Footprint

It ensures energy availability for the
Next Generation



Saving electricity goes beyond reducing your electricity bill. It is also about saving your environment, reducing your carbon footprint and ensuring energy is available for your children. So, the next time you see someone wasting electricity at your home or office, stop them. Do your part in overcoming the climate change challenge.

EASY TIPS TO SAVE ELECTRICITY

- Replace all incandescent light bulbs with energy efficient LED Lamps.
- Switch off fans, lights & other appliances when not in use.
- Set Air Conditioner temperature setting to 25-27° C.
- Regularly clean air conditioner filters.
- Buy BEE Star labelled and products only.

For more details kindly visit our website www.beeindia.in or send an email to helpdesk@beeindia.in

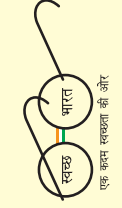


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