

Carbon Credits : A Primer



Introduction

The Kyoto Protocol of 1997 and the Paris Agreement of 2015 were international accords that laid out international CO₂ emissions goals. With the latter ratified by all but six countries, they have given rise to national emissions targets and the regulations to back them. With these new regulations in force, the pressure on businesses to find ways to reduce their carbon footprint is growing. Most of today's interim solutions involve the use of the carbon markets. What the carbon markets do is turn CO₂ emissions into a commodity by giving it a price. These emissions fall into one of two categories: Carbon credits or carbon offsets, and they can both be bought and sold on a carbon market. It's a simple idea that provides a market-based solution to a thorny problem.

What is a carbon credit?

A carbon credit is a kind of permit that represents 1 ton of carbon dioxide removed from the atmosphere. They can be purchased by an individual or, more commonly, a company to make up for carbon dioxide emissions that come from industrial production, delivery vehicles or travel.



Carbon credits are most often created through agricultural or forestry practices, although a credit can be made by nearly any project that reduces, avoids, destroys or captures emissions. Individuals or companies looking to offset their own greenhouse gas emissions can buy those credits through a middleman or those directly capturing the carbon. In the case of a farmer that plants trees, the landowner gets money; the corporation pays to offset their emissions; and the middleman, if there is one, can earn a profit along the way.

Carbon credits are measurable, verifiable emission reductions from certified climate action projects. These projects reduce, avoid or remove greenhouse gas (GHG) emissions. Moreover, they also bring a whole host of other positive benefits, for example, they empower communities, protect ecosystems, restore forests, or reduce reliance on fossil fuels. Carbon credits are permits that allow the owner to emit a certain amount of carbon dioxide or other greenhouse gases (GHGs). One credit allows the emission of one ton of carbon dioxide or the equivalent of other greenhouse gases. Carbon credits are also known as carbon offsets.

The carbon credit is half of a cap-and-trade program. Companies that pollute are issued credits that allow them to continue to pollute up to a certain limit that's periodically reduced. The company can sell any unneeded credits to other companies that need them so private companies are doubly incentivized to reduce greenhouse emissions.

Carbon credits can help companies to meet their climate-change goals

Under the 2015 Paris Agreement, nearly 200 countries have endorsed the global goal of limiting the rise in average temperatures to 2.0 degrees Celsius above preindustrial levels, and ideally 1.5 degrees. Reaching the 1.5-degree target would require that global greenhouse-gas emissions are cut by 50 percent of current levels by 2030 and reduced to net zero by 2050. More companies are aligning themselves with this agenda: in less than a year, the number of companies with net-zero pledges doubled, from 500 in 2019 to more than 1,000 in 2020.



To meet the worldwide net-zero target, companies will need to reduce their own emissions as much as they can (while also measuring and reporting on their progress, to achieve the transparency and accountability that investors and other stakeholders increasingly want). For some companies, however, it's prohibitively expensive to reduce emissions using today's technologies, though the costs of those technologies might go down in time. And at some businesses, certain sources of emissions cannot be eliminated. For example, making cement at industrial scale typically involves a chemical reaction, calcination, which accounts for a large share of the cement sector's carbon emissions. Because of these limitations, the emissions-reduction pathway to a 1.5-degree warming target effectively requires "negative emissions," which are achieved by removing greenhouse gases from the atmosphere.



How companies can offset carbon emissions

There are countless ways for companies to offset carbon emissions. Though not a comprehensive list, here are some popular practices that typically qualify as offset projects:

- **Investing in renewable energy** by funding wind, hydro, geothermal, and solar power generation projects, or switching to such power sources wherever possible.
- **Improving energy efficiency** across the world, for instance by providing more efficient cook stoves to those living in rural or more impoverished regions.
- **Capturing carbon from the atmosphere** and using it to create biofuel, which makes it a carbon-neutral fuel source.
- **Returning biomass to the soil** as mulch after harvest instead of removing or burning. This practice reduces evaporation from the soil surface, which helps to preserve water. The biomass also helps feed soil microbes and earthworms, allowing nutrients to cycle and strengthen soil structure.
- **Promoting forest regrowth** through tree-planting and reforestation projects.
- **Switching to alternate fuel types**, such as lower-carbon biofuels like corn and biomass-derived ethanol and biodiesel.

Why Should Levels of Carbon and Greenhouse Gases Be Reduced in the Atmosphere?

Scientists at the United Nations' Intergovernmental Panel on Climate Change (IPCC) have shown that increased levels of greenhouse gases (GHG) in the atmosphere are warming the planet. This creates extreme weather changes around the world. Carbon dioxide is the main GHG. It's created by burning fossil fuels that include coal, oil, and gas. Reducing the amount of carbon dioxide we emit may avoid further damage to our climate.

Why Companies Buy Carbon Credits

Companies buy carbon credits to offset their emissions. There's growing public and institutional pressure for companies to make net-zero commitments given the urgency of the climate crisis. These are pledges that companies take to cut the amount of carbon they emit throughout their operations. Reductions in emissions are possible through changes in business practices for some companies but a wholesale elimination of emissions isn't feasible for most firms. Carbon credits fund emission-reduction activities such as tree-planting or nature conservation in lieu of completely eliminating their own emissions.

Are Carbon Credits the Same as Offsets?

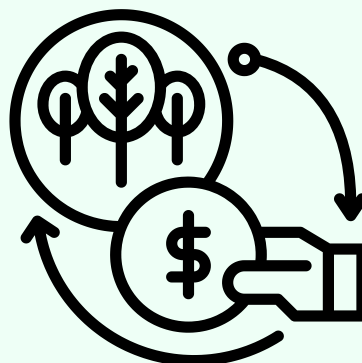
They are not. Both carbon credits and offsets are measured in tonnes of CO₂e, which can make it confusing for people because offsets and credits are absolutely not the same thing. Unlike carbon credits, offsets are not created or distributed by a specific regulatory body. They are also not limited to individual regulatory jurisdictions (like carbon credits are) – in fact, they may trade freely on any number of “voluntary markets” around the world. If carbon credits are a measurement unit to “cap” emissions (meaning permissible emissions), carbon offsets can be thought of as a measurement unit to “compensate” an organization for investing in green projects or initiatives (whether natural or technological) that remove emissions.

The offset advantage: New revenue streams

There’s one more big advantage of carbon offsets. If you’re the company selling them, they can be a significant revenue stream! The best example of this is Tesla. Yes, that Tesla, the electric car maker, who sold carbon credits to legacy car manufacturers to the tune of \$518 million in just the first quarter of 2021. That’s a huge deal, and it’s single-handedly keeping Tesla out of the red. If the market for carbon credits continues to go up, and the pricing of credits keeps increasing, Tesla and other environmentally beneficial businesses could reap huge dividends.

What projects create carbon credits?

Carbon credits were devised as a mechanism to reduce greenhouse gas emissions by creating a market in which companies can trade in emissions permits. Companies receive a set number of carbon credits under the system that decline over time. They can sell any excess to other companies. Carbon credits create a monetary incentive for companies to reduce their carbon emissions. Those that can’t easily reduce emissions can still operate but at a higher financial cost. Proponents of the carbon credit system say that it leads to measurable, verifiable emission reductions. Carbon credits are created from projects that avoid the generation of GHG emissions or that remove GHGs from the atmosphere. These projects include “nature-based solutions,” such as reforestation and regenerative agriculture efforts, and “engineered solutions,” such as combusting methane emitted from landfills to electricity and direct air capture.



What are carbon markets?

In a nutshell, carbon markets are trading systems in which carbon credits are sold and bought. Companies or individuals can use carbon markets to compensate for their greenhouse gas emissions by purchasing carbon credits from entities that remove or reduce greenhouse gas emissions. One tradable carbon credit equals one tonne of carbon dioxide or the equivalent amount of a different greenhouse gas reduced, sequestered or avoided. When a credit is used to reduce, sequester, or avoid emissions, it becomes an offset and is no longer tradable.



How many types of carbon markets are there?

There are broadly two types of carbon markets: compliance and voluntary.

Compliance markets are created as a result of any national, regional and/or international policy or regulatory requirement. Voluntary carbon markets – national and international – refer to the issuance, buying and selling of carbon credits, on a voluntary basis. The current supply of voluntary carbon credits comes mostly from private entities that develop carbon projects, or governments that develop programs certified by carbon standards that generate emission reductions and/or removals. Demand comes from private individuals that want to compensate for their carbon footprints, corporations with corporate sustainability targets, and other actors aiming to trade credits at a higher price to make a profit.

Examples of players in the carbon credit marketplace

- **Carbon credit registries and standards bodies:** VERRA's Verified Carbon Standard (VCS), Gold Standard, Climate Action Reserve, American Carbon Registry (ACR), Puro. Earth, and Isometric
- **Carbon credit and offsetting principles:** Integrity Council for the Voluntary Carbon Market's Core Carbon Principles and Oxford Net Zero-Aligned Offsetting Principles
- **Carbon credit verifiers:** SCS Global Services and DNV
- **Carbon credit brokers and marketplaces:** 3Degrees, Cloverly, Lune, Patch, South Pole Group, and Terrapass
- **Carbon credit ratings agencies:** BeZero, Calyx, and Sylvera

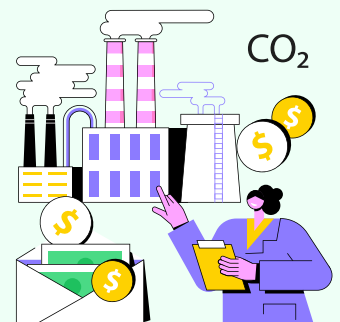
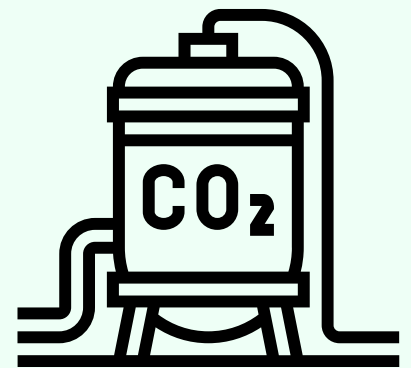
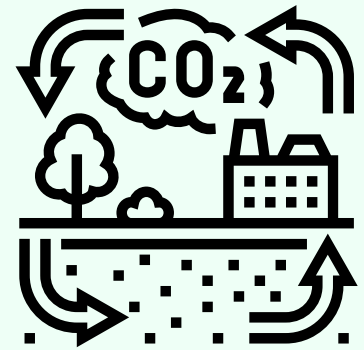
How Large Is the Carbon Credit Market?

The voluntary carbon market is difficult to measure. The cost of carbon credits varies, particularly for carbon offsets, since the value is linked closely to the perceived quality of the issuing company. Third-party validators add a level of control to the process, guaranteeing that each carbon offset actually results from real-world emissions reductions, but even so there's often disparities between different types of carbon offsets. While the voluntary carbon market was estimated to be worth about \$400 million last year, forecasts place the value of the sector between \$10-25 billion by 2030, depending on how aggressively countries around the world pursue their climate change targets.

Who are the players?

Unlike with stock exchanges, carbon credits lack widely adopted standards and large centralized marketplaces. This makes it difficult to find, understand, and compare carbon credit projects.

Instead, leaders have to navigate a maze of various standards and players with frustratingly overlapping roles. There are numerous carbon credit registries and standards bodies that provide minimum requirements for various project attributes and in some cases list projects that meet their own standards.



- **Carbon credit verifiers**, also known as validation/verification bodies (VVBs), assess whether projects meet certain standards. They range from global companies to niche players that focus on just one type of project.
- **Carbon credit brokers and marketplaces** connect buyers with project developers. Some list projects they helped finance and develop, raising the potential for conflicts of interest.
- **Carbon credit ratings agencies** assess carbon credit projects along various dimensions, including but not limited to the attributes featured in standards. They tend to sell their ratings via a subscription model to prospective credit buyers. These ratings agencies provide much-needed transparency and convey key attributes of the projects they rate.

With so many players and many standards, it's no wonder companies find it difficult to navigate the landscape. The Voluntary Carbon Markets Integrity Initiative or Oxford Net-Zero Aligned Offsetting Principles provide holistic carbon credit and offsetting principles and are a great place for leaders to start, but even these are updated periodically to keep pace with the changing landscape.

How does carbon credit trading work in practice?

Carbon credit trade has three stages – create, issue, and trade/retire.

Create: Example of a farmer planting trees – first, the farmer will plant the tree. Next, the farmer, or the project developer who hired the farmer, will conduct a Baseline Emissions Assessment (BEA), i.e. an assessment of how much carbon is being removed from the atmosphere, and prepare a Project Design Document (PDD) that includes results from the BEA as well as other details about the execution and monitoring of the tree plantation project.

Issue : Then, an independent verifying body will validate the PDD and issue a report that confirms that the project is eligible for carbon credits. The project developer must then submit this report to a standards program that will officially issue the carbon credit and enter it in their records.

Trade/ Retire : The project developer can then decide to sell the carbon credit, for example to a steel company that wants to lower its net emissions. For this, they have to notify the standards program, which in turn will retire the carbon credit in their records, i.e. note that it has been claimed by the steel company and is therefore no longer in circulation.

How much is a carbon credit worth?: While there is significant international momentum around creating a standardized price for a single carbon credit, today the price for a carbon credit is highly variable ranging from a few rupees to a few thousand rupees. As with any other tradeable commodity, the price of a carbon credit comes down to its quality. Quality in this case refers to three key aspects – credibility, durability, and existence of spillover benefits.



What determines the quality of a carbon credit?

To qualify as a carbon finance project it must meet some fundamental criteria, and pass Climate Impact Partners' own stringent quality assurance requirements. Specifically, high-quality projects must meet the following criteria to establish the quality of the carbon credit. These are designed to ensure quality in carbon market approaches to meet global climate goals:

- **Real.** The avoidance or removal of CO₂e must actually occur.
- **Measurable.** It must be possible to reliably quantify an emission reduction.
- **Additional.** This means that there is a net emission reduction that would not have happened were it not for the sale of carbon credits. For example, if a project were already legally required to do what it is doing it would not count as additional, nor would it be additional if it can achieve all its funding through other mechanisms. The sale of carbon credits is required to enable the project to take place.
- **Unique.** Each tonne of CO₂e avoided or removed must count towards only one carbon credit. Companies cannot double count the same carbon credit towards separate emission reductions targets.

- **Permanent.** This focuses on how long the carbon dioxide removed or avoided will be kept out of the atmosphere. To count as permanent, the reduction must be designed to last for at least 100 years, with robust measures to prevent and compensate for future events that might reverse the reduction. Projects that are at risk of reversal, such as forestry projects that may be damaged by wildfire, must allocate a portion of carbon credits - determined by risk factors - to a central buffer pool, which cannot be traded on the voluntary carbon market. The buffer pool acts as an insurance pot, ensuring there are spare carbon credits, in the event of future worst-case scenarios.
- **Risk managed.** This involves taking steps to ensure that the project is developed as envisaged, continues to follow evolving scientific evidence and meets the relevant standard's rules, and doesn't fall foul of changing legislation and regulations. Climate Impact Partners has considerable expertise here, with more than 25 years taking projects through the full cycle, from idea through to carbon credit retirement (see below).
- **Independently verified.** An independent auditor must review each project to validate that it follows the appropriate methodology that has been set by a standard, and to verify that the monitoring and measurement of emission reductions are accurate before carbon credits are issued.

What are the challenges?

Progress has been made towards agreeing on the processes and methodologies that countries need to follow to access the carbon markets. And there are many opportunities - not least the benefits that will accrue by diverting a share of the proceeds to support the most vulnerable countries to adapt to climate change. However, there are also serious concerns including issues related to double-counting of GHG emission reductions, human rights abuses, and green washing (in which companies falsely market their green credentials, for example, misrepresentations of climate-neutral products or services). Which is why the Paris Agreement negotiations on this topic have been so complex and protracted. For carbon markets to be successful, these issues must be addressed. Emission reductions and removals must be real and aligned with the country's NDC. There must be transparency in the institutional and financial infrastructure for carbon market transactions. And there must be adequate social and environmental safeguards to mitigate against any adverse project impacts - and to promote positive ones.

Looking ahead

UN Secretary-General Antonio Guterres has urged the world to “put the pedal to the metal” in addressing the climate crisis. If held to high standards of integrity and transparency, carbon markets can help accelerate the transformation needed, by effectively putting a price on pollution and creating an economic incentive for reducing emissions. They can also help generate some of the vast sums needed to build resilience.

Conclusions

With the enormous growth in companies' use of carbon credits to meet their sustainability goals and carbon footprint reduction targets, there is an increasingly wide range of projects that are generating carbon credits from which to choose. Companies should choose the carbon credit strategy that best meets their objectives. Purchasing high-quality credits reduces the risk of negative publicity and green washing charges and bolsters the odds that the carbon you think you are avoiding or removing is actually being avoided and removed – in both the short and long terms. Last year, the Government of India announced its intent to roll out a Carbon Credit Trading Scheme by 2026. While the National Steering Committee for the Indian carbon market is yet to announce more details, the official notice referred to a voluntary as well as a compliance-based element to the scheme.

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