Are Carbon Credits Contributing to the Energy Transition?

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Source: Lyfthouse

What are Carbon Credits?

Carbon credits are effectively permits that provide the buyer of the credits with the right to emit a certain amount of carbon dioxide - or other greenhouse gasses (GHG). One carbon credit allows the emission of one ton of carbon dioxide - or the equivalent for other greenhouse gases.

Carbon credits were devised as a mechanism to reduce greenhouse gas emissions by establishing a monetary incentive for companies to reduce their emissions. Companies receive a set number of credits that decline over time. They can sell any excess credits to another company.

The United Nations allows countries a certain number of credits, and each nation is responsible for issuing, monitoring, and reporting its carbon credit status annually. Governments allow companies to emit a set amount of GHG before needing to purchase credits.

If emissions exceed limits, the companies are required to buy additional credits. If a company purchases too many credits, it can sell the excess on a carbon exchange or marketplace (more on these later).

Carbon credits are, for the most part, based on the cap-and-trade model that was used to reduce sulfur pollution in the US in the 1990s. The US has been regulating airborne emissions since the passage of the U.S. Clean Air Act of 1990. The act is credited as the world's first cap-and-trade program (although the

Act refers to caps as "allowances"). In 2005, the EPA released another cap-and-trade program through its Clean Air Interstate Rule (CAIR), which covers sulfur dioxide and nitrogen oxides

Cap-and-trade programs actually remain controversial in the US, but 14 states have adopted cap-and-trade programs to reduce greenhouse gases. Eleven of them are states in the northeast that got together starting in 2005 to address the issue through a program known as the Regional Greenhouse Gas Initiative (RGGI).

The state of California initiated a cap-and-trade program in 2013. The rules apply to the state's large electric power plants, industrial plants, and fuel distributors. California claims that its program is the fourth largest in the world - after those of the European Union, South Korea, and China. California is gradually reducing the number of credits (which it also calls "allowances") that it is issuing to further incentivize companies to reduce their emissions.

While cap-and-trade is the dominant form of carbon credit trading there is an alternative known as the Baseline-and-Credit System (Reduction Trading – in contrast with the term Allowance Trading associated with Cap & Trade).

Under a baseline-and-credit scheme, an emissions intensity is set for emitting activities against a baseline (which can be business as usual or some proportion thereof) and credits are created for activities that achieve emissions intensities below the baseline. For example, if the emissions prior to a reduction project were 10,000 tons and after the project emissions were down to 7,000 tons, then the surplus quota that can be sold is 3,000 tons. Activities that have emissions intensities above the baseline have to buy such credits.

Australia has implemented a range of baseline-and-credit schemes at the state and national level, including the Renewable Energy Target (RET), the New South Wales Greenhouse Gas Reduction Scheme (GGAS) and the New South Wales Energy Savings Scheme (ESS).

Since the baseline-and-credit method trades "emissions" rather than emissions allowances, they could make it easier for a business to reduce the amount of emissions. The cap-and-trade method trades greenhouse gas emission allowances. In this method, each business has a cap on how much they can emit; when they have excess emission allowances they sell the surplus to other companies, and when they do not have enough, they purchase allowances from other companies. The advantage of the cap-and-trade system is that it greatly benefits businesses that make large reductions, or those who sell emissions allowances.

Some companies share a portion of their carbon credit proceeds with technology companies that help them lower carbon emissions. Companies may directly partner with tech firms, offering a share of carbon credit revenue in exchange for developing and implementing emission-reducing technologies. Some companies use their carbon credit funds to invest in new technology startups focused on carbon capture and removal solutions.

Companies like Microsoft, Google, and Meta have invested in carbon removal projects and may incentivize tech developers with carbon credit shares for creating innovative solutions. Meta, Microsoft, Google and Salesforce announced the launch of an alliance that aims to invest in nature-based carbon removal projects: the *Symbiosis Coalition*

According to a press statement announcing the initiative, the companies said they aim to address the "perceived lack of high-quality restoration projects and uncertainty around willingness to pay" that have kept investors at bay and impacted public trust in the potential of carbon credits.

The Symbiosis Coalition will initially focus on afforestation, reforestation and revegetation projects. For this, according to the press statement, the alliance has worked with independent experts to establish guidelines on what constitutes a good forestry project.

Bottom line: carbon credits create a market-based system where companies are financially motivated to lower their carbon emissions. By putting a price on carbon, it encourages investment in cleaner, more efficient technologies. This market-driven approach provides a reasonably flexible and cost-effective way for businesses to meet environmental targets.

Worldwide Carbon Credit Initiatives

The United Nations' Intergovernmental Panel on Climate Change (IPCC) developed a carbon credit proposal to reduce worldwide carbon emissions in a 1997 agreement known as the Kyoto Protocol. The agreement set binding emission reduction targets for the countries that signed it. Another agreement, the Marrakesh Accords, spelled out the rules for how the system would work.

The Kyoto Protocol divided countries into industrialized and developing economies. Industrialized countries were collectively called Annex 1. They operated in their own emissions trading market. A country could sell its surplus credits to countries that didn't achieve their Kyoto-level goals through an Emissions Reduction Purchase Agreement (ERPA) if it emitted less than its target amount of hydrocarbons.

Source: The Invisible Narad

The separate Clean Development Mechanism for developing countries issued Certified Emission Reduction (CER) carbon credits. A developing nation could receive these credits for supporting sustainable development initiatives. The trading of CERs took place in a separate market.

The first commitment period of the Kyoto Protocol ended in 2012. The U.S. had already dropped out in 2001. The Kyoto Protocol was revised in 2012 in an agreement known as the Doha Amendment.

The Paris Agreement of 2015, also known as the Paris Climate Accord, is an agreement among its members to reduce greenhouse gas emissions and limit the global temperature increase to less than 2° Celsius or 35.6° Fahrenheit above preindustrial levels by the year 2100.

More than 190 nations signed the Paris Agreement, which set emission standards and allowed for emissions trading. The U.S. dropped out in 2017 under President Donald Trump but subsequently rejoined the agreement in January 2021. (Stay tuned for 2025).

Negotiators at the November 2021 COP26 summit in Glasgow negotiated a deal that saw nearly 200 countries implement Article 6 of the Paris Agreement. (Article 6 was intended to set rules to strengthen the integrity of carbon markets and create a new global carbon offsetting mechanism). It allows nations to work toward their climate targets by purchasing offset credits that represent emission reductions by other countries. (More on offsets below). The hope was that the agreement would encourage governments to invest in initiatives and technology that protect forests and build renewable energy technology infrastructure to combat climate change.

Brazil's chief negotiator at the summit stated that his country – which has a lot of forest land - planned to be a major trader of carbon credits. "It should spur investment and the development of carbon projects that could deliver significant emissions reductions," he stated at the time.

Several other provisions in the accord aimed at reducing overall global emissions include a zero tax on bilateral trades of offsets between countries and canceling 2% of total credits. Additionally, 5% of revenues generated from offsets are placed in an adaptation fund for developing countries to help fight climate change. Negotiators also agreed to carry over credits that had been registered since 2013, allowing 320 million credits to enter the market.

Are Carbon Credits the Same as Carbon Offsets?

Companies buy carbon credits to legally emit more GHGs. They can also purchase something referred to as carbon offsets, which allow them to aim for a "net-zero carbon emission" rate.

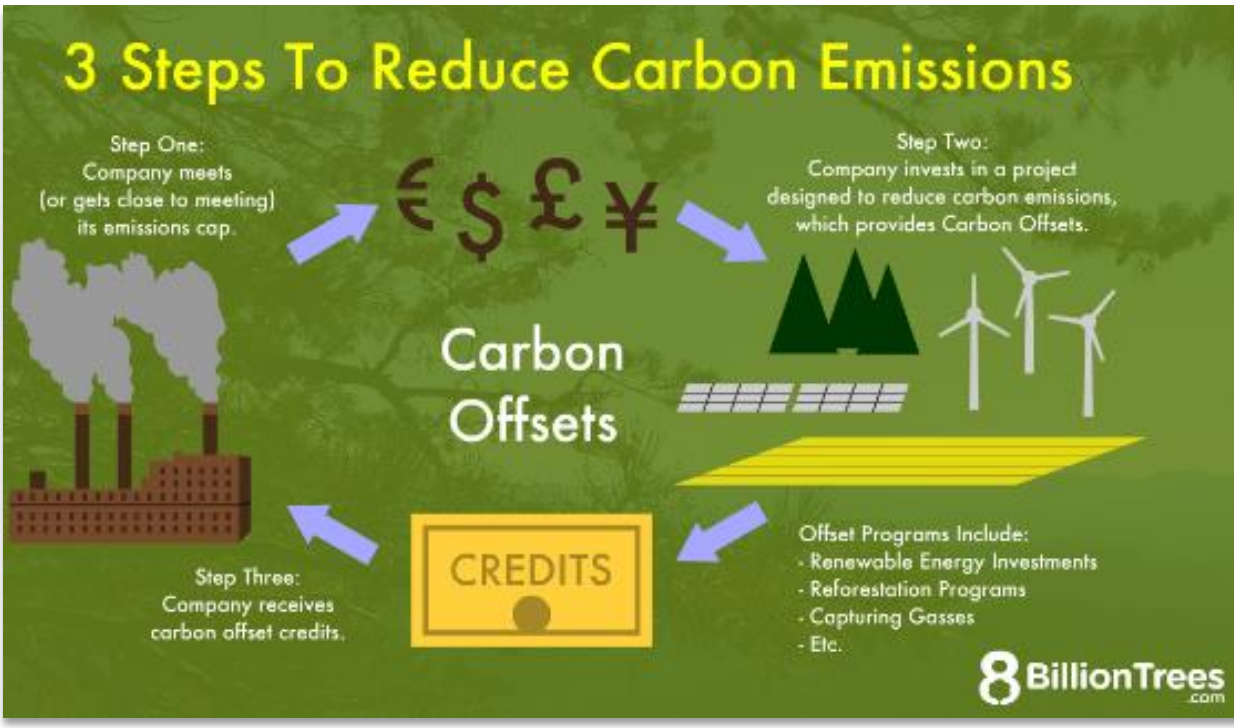
The terms Carbon Credits and Carbon Offsets are sometimes used interchangeably, but they are not really the same. Both are intended to reduce greenhouse gas emissions, but they differ in several ways.

Carbon credits can only be purchased or sold by businesses and governments, and only on a regulated carbon market. Carbon offsets, however, are available on the *voluntary* carbon markets. (More on this market later). The voluntary carbon market enables entities participating in an emissions reduction project to sell credits that are not regulatory in nature. Carbon offsets can be sold on the voluntary carbon credit market by organizations, projects, or individuals to fund their green projects. For example, landowners may be able to sell carbon offsets if they enroll their land into a project such as reforestation or aforestation and use the funds to pay for their operations.

Carbon credits are thus used to limit emissions, while carbon offsets are used to compensate for emissions:

- Carbon credits are intended to limit the level of emissions a company can release. Companies that exceed their limit must buy additional credits. That makes carbon credits a financial incentive for companies to reduce their emissions.
- Carbon offsets are tradable “rights” or certificates linked to activities that lower the amount of carbon dioxide (CO_2) in the atmosphere. Carbon offsets can be created by investing in projects that remove carbon from the atmosphere, such as renewable energy or carbon sequestration. By buying these certificates, a person or group can fund projects that fight climate change, instead of taking actions to lower their own carbon emissions.

Some common examples of carbon offset projects include reforestation, renewable energy systems, carbon-storing agricultural practices, and waste and landfill management. Reforestation is one of the most popular types of projects to produce carbon offsets. Carbon offsets are granted to project owners, who sell them to third parties like companies that want to balance the CO_2 they put into the atmosphere by paying to remove CO_2 from somewhere else.



Source: LinkedIn

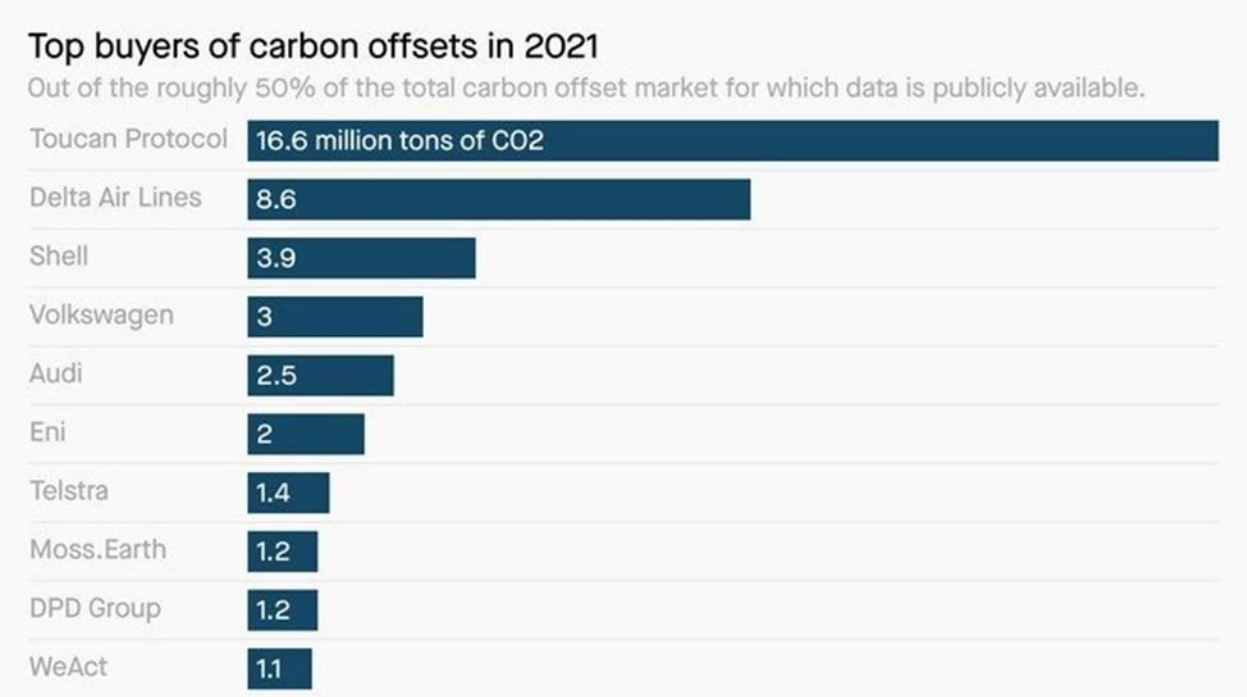
Although carbon offsets are relatively easy to understand, there are multiple challenges in producing them, including the difficulty of verifying their environmental benefits. To issue carbon offsets, a project needs to prove it will actually reduce emissions. The amount of CO_2 being kept out of the atmosphere also needs to be accurately measured. This process requires well-documented protocols and a way to verify that the project is doing what it claims. This process can vary from project to project and be

expensive. Several studies of offset markets have found evidence of “over-crediting,” or selling offsets that promise more emissions reductions than they actually achieve.

That being said, the advantages of carbon offsets probably outweigh their challenges. For example, a company trying to switch from a process that emits a lot of CO_2 to a carbon-free but expensive technology can issue a carbon offset for each ton of CO_2 its new technology keeps out of the air, helping to pay for the project.

The price of carbon offsets can vary widely, from less than $1 per ton to more than $500 per ton. The price of a quality carbon credit is closer to $30–$50 per credit.

Carbon offsets are being purchased by a wide range of major corporations. Here is a list of the top buyers of carbon offsets in 2021:



Carbon Credit – Carbon Tax – Carbon Tax Credit

Yes, these are 3 different things.

A ***carbon tax*** is a type of penalty that businesses must pay for excessive greenhouse gas emissions. The tax is usually levied per ton of greenhouse gas emissions emitted. Carbon taxes represent another way for governments to attempt to control greenhouse gas emissions. Unlike the case for carbon credits and carbon trading, there is no market on which companies can buy credits to offset carbon taxes.

Carbon taxes have been implemented in 37 countries to-date. The US has not enacted a carbon tax although a number of proposals for one have been submitted to the US Congress

On the other hand, in the US, the Inflation Reduction Act (IRA, signed into law in Aug. 2022) rewards high-emitting companies that store their greenhouse gases underground or use them to build other products. The rewards are in the form of ***tax credits*** that have increased significantly since the IRA was enacted from $50 to $85 for each metric ton of captured carbon stored underground and from $35 to $60 for each ton of captured carbon that's used in other manufacturing processes or for oil recovery.

Lots of terminology to learn.

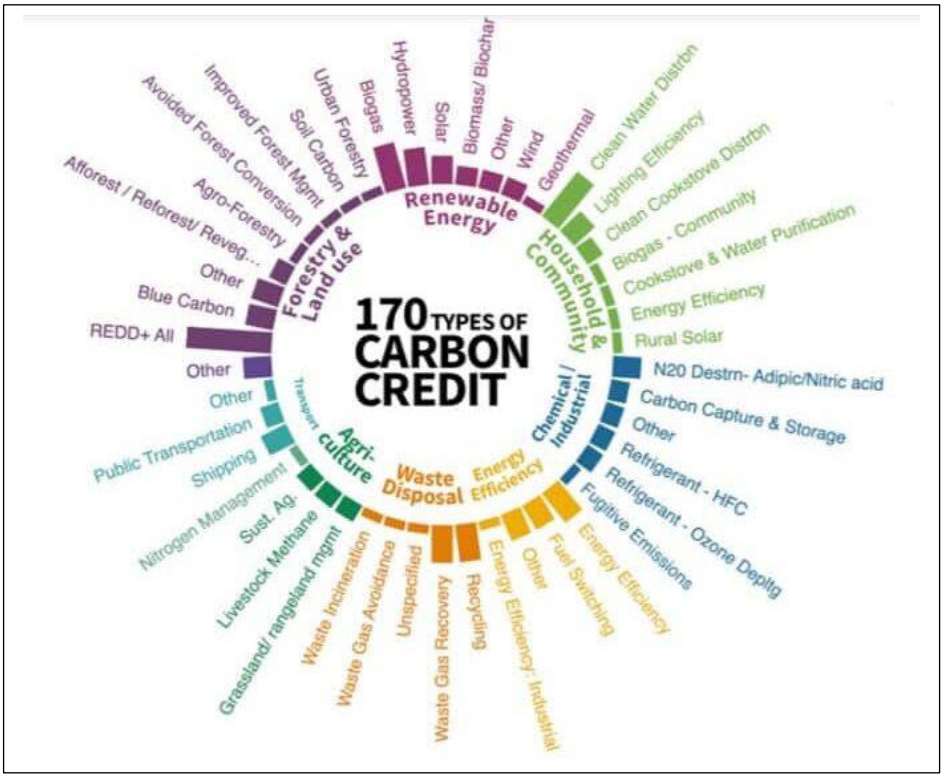
What Are Carbon Markets?

A carbon ***market*** is a specialized type of market that facilitates the purchase and sale of carbon credits – and offsets.

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

- ***Compliance markets*** are established by governments or multi-government bodies that control the supply of credits and regulate their trading. Certain industries are required to participate in these markets
- ***Voluntary markets*** are those in which carbon credits – or carbon offsets - may be traded voluntarily.

According to the UN: "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. And carbon is now tracked and traded like any other commodity".



Source: Media Fire

Both compliance and voluntary markets continue to grow rapidly.

Entities can create carbon credits or offsets by either reducing or removing carbon dioxide, which they can then sell. Reduction refers to initiatives that serve to lower emissions, such as adding solar panels or building a wind farm, while removal refers to projects that remove and then store carbon dioxide, such as through reforestation or carbon capture technologies.

The European Union's EU Emissions Trading System (ETS), launched in 2005, is credited as the first compliance carbon market and claims to be one the world's largest. It covers all of the EU nations plus Iceland, Liechtenstein, and Norway, and regulates emissions involving some 10,000 facilities in the energy and manufacturing sectors, as well as aircraft operators in the region. It was slated to add the maritime transportation industry in 2024.

China introduced its own ETS in 2021, which it claims to be the world's largest in terms of covered emissions. Its initial focus was strictly limited to power companies.

Other major markets include the United Kingdom Emissions Trading System (UK-ETS), established in 2021 and operating independently from EU-ETS; Australia's Emissions Reduction Fund (ERF); and Singapore's AirCarbon Exchange (ACX).

The US does not have a national carbon market of its own, although, as noted earlier there are multiple state-run programs

In terms of voluntary markets, two of the largest are the Xpansiv CBL exchange in the U.S. and ACX (formerly AirCarbon Exchange) in Singapore.

The UN has also launched a voluntary United Nations Carbon Offset Platform, where organizations and individuals "can purchase units (carbon credits) to compensate greenhouse gas emissions or to simply support action on climate.

There are 30 compliance carbon markets around the world - and a large number of voluntary ones.

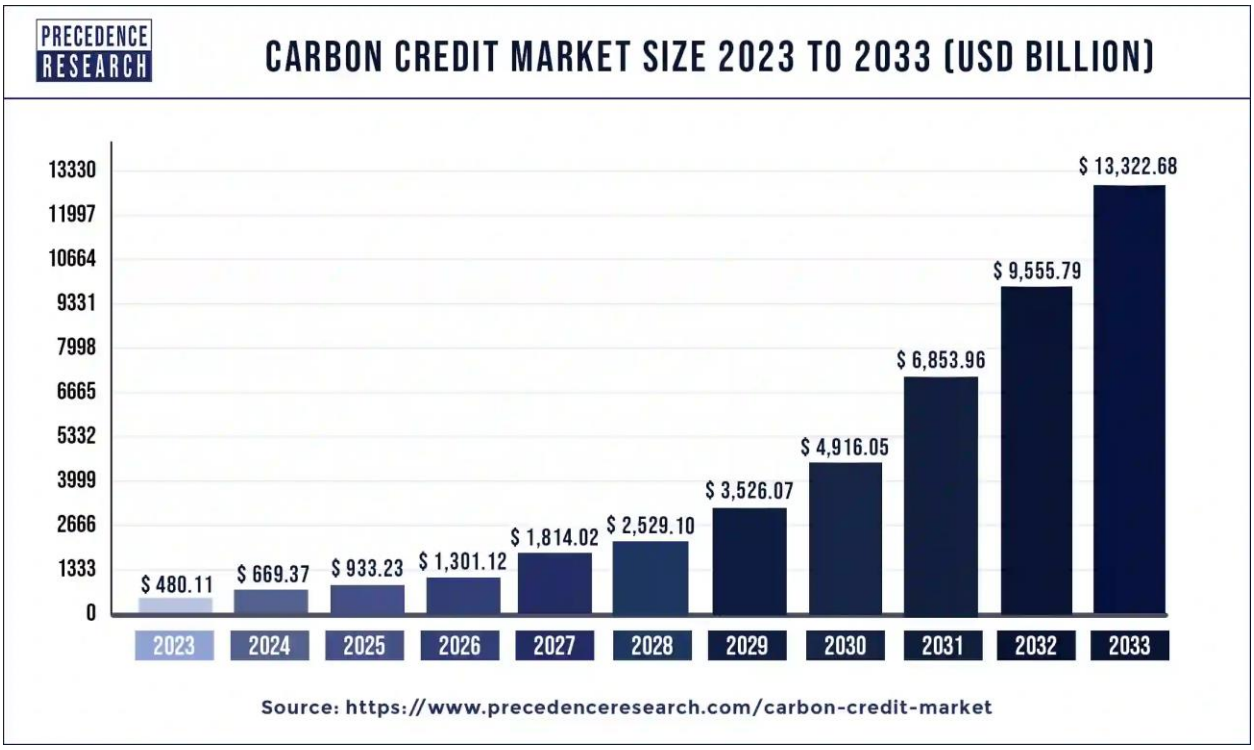
Carbon Credit Market Size - and Expected Growth

The global carbon credit market size was valued at USD 480 billion in 2023 and is anticipated to grow by almost 40% a year and reach around USD 13.3 billion by 2033.

Some more details on the carbon market

- Europe had the largest share - 90% - in 2023.
- North America is expected to experience the fastest growth during this period.
- The largest sellers of carbon credits are currently China and India.
- By project type, the avoidance/reduction segment generated more than 67% of revenue in 2023.

- The power industry was responsible 32% of carbon industry in 2023, the highest of any industry.
- Voluntary markets were only responsible for about $2 billion in credits/offsets in 2023 but are expected to grow to $100 billion by 2030.



The carbon credit market by region is shown in the image below.

Pros and Cons of Carbon Markets – and Carbon Credits

Proponents argue that a cap-and-trade program incentivizes companies to invest in cleaner technologies in order to avoid buying credits that will increase in cost each year. Opponents argue that these systems only work to create an excess of circulating carbon credits because caps are set a few years in advance, and companies cut emissions quicker than expected—and then use the credits as money-making instruments.

Carbon markets put a price tag on GHG emissions, rewarding businesses – and nations - that reduce their emissions over time and creating financial disincentives for those that emit more than their share.

According to the World Bank: “Carbon markets help mobilize resources and reduce costs to give countries and companies the space to smooth the low-carbon transition.”

Adopting and encouraging the use of carbon markets, whether mandatory or voluntary, allows nations that signed the Paris Agreement to meet their obligations so they can collectively reach their goals.

A 2017 analysis of various cap-and-trade programs by professors at the Massachusetts Institute of Technology and Harvard University concluded: “Overall, we have found that cap-and-trade systems, if well designed and appropriately implemented, can achieve their core objective of meeting targeted emissions reductions cost-effectively. But the devil is in the details, and design as well as the economic environment in which systems are implemented are very important.” By themselves, the authors added, these programs are “surely not sufficient” to address the problem of climate change.

Companies that buy carbon credits are doing more to tackle their climate footprints than companies that don't, according to a 2023 Ecosystem Marketplace report.

The report is probably the most detailed snapshot of how companies are addressing climate change, including through carbon credits. The report indicated that the market has seen an uptick in demand for pricier, higher-quality carbon credits, suggesting companies are willing to pay more to ensure and maximize their climate impact. According to the report, by buying carbon credits and offsets, companies - and individuals - can reduce their carbon footprint by preventing emissions elsewhere. For example, credits can generate funds to pay for the protection of a specified area of natural forests, which remove and store climate-warming carbon from the atmosphere. Yet critics have called out carbon credits as a license for companies to pollute.

This report tries to dispel that notion. It analyzed voluntary carbon market transactions and corporate climate change disclosures of more than 7,400 companies with a combined USD 110 trillion in assets and found that not only are companies that invest in the carbon market nearly twice as likely to be reducing their carbon emissions year over year they are also outperforming their competitors in addressing climate change in their supply chains.

Key findings from the report:

- Nearly 60 percent of carbon credit buyers reported lower year-over-year carbon emissions as compared with companies that do not participate in carbon markets.
- Companies that buy carbon credits are more than three times as likely to have science-based climate targets as do companies that don't.
- They are also more likely to disclose their emissions, including Scope 3 emissions — emissions associated with consumers' use of companies' goods and services - which are among the most difficult to abate.
- Lastly, carbon credits represent a tiny share of corporate greenhouse-gas emissions: Rather than a way to "buy their way" out of their climate footprint, as many critics have characterized them, the carbon credits that companies buy represent just over 2 percent of their total footprint.

Following the report, the CEO of Conservation International stated: "We are in a race against time, and the global scientific consensus is clear: We must invest in nature to combat climate change. Carbon credits offer an immediate way for businesses to reduce global emissions, and today's report reaffirms what we've long known — that carbon credit buyers tend to be leaders in taking climate action. Those criticizing them or lagging on the sidelines should take note."

The carbon credit mechanism has a widespread impact due to its global applicability and scalability. Carbon credits operate on an international scale, enabling countries and companies around the world to collaborate in reducing emissions. This global framework facilitates the transfer of green technologies and sustainable practices across national boundaries, enhancing the collective effort against climate change.

On the other hand, while carbon markets have important potential benefits, they are also controversial. Critics on the right argue that mandatory programs interfere with business and cost jobs. Critics on the

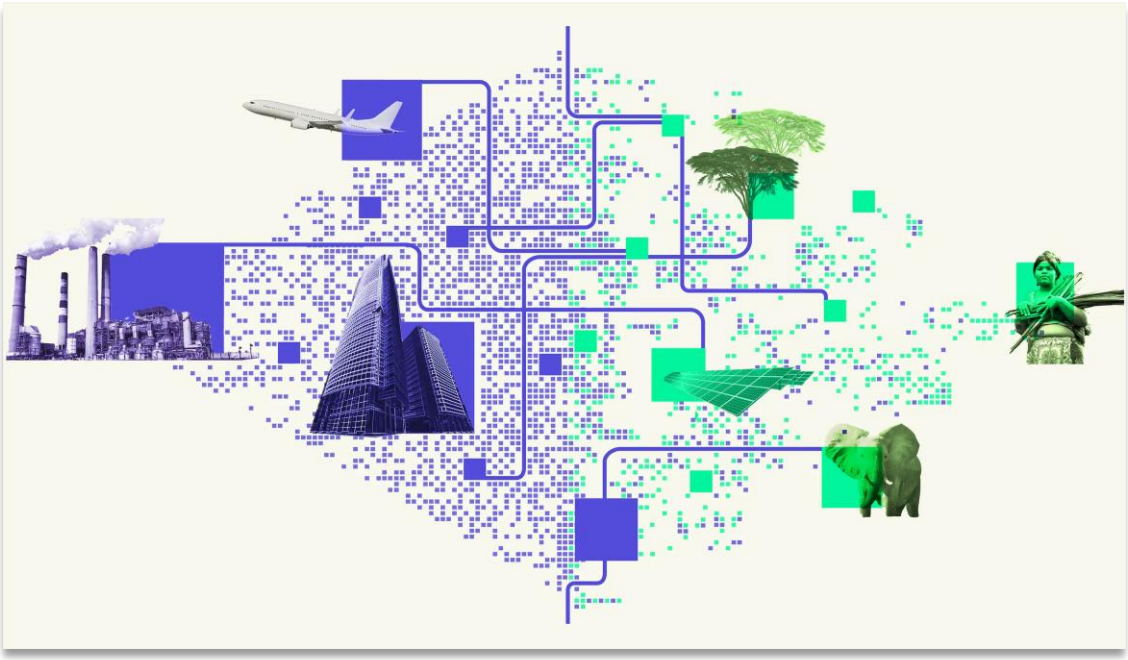
left maintain that the programs don't go far or fast enough to address the urgent problem of climate change.

Carbon offsets draw the most criticism. For example, the *Center for American Progress* commented in 2022 that "for a variety of reasons, many offsets simply do not achieve the results they claim." The organization also suggested that carbon credits play a role in *greenwashing* – the act of providing the public or investors with misleading or outright false information about the environmental impacts of a company's products or operations. It stated that: the "carbon offsets may serve as a convenient way for businesses to claim that they are climate friendly while avoiding taking steps toward tangibly reducing their own carbon footprints".

A 2023 report from the World Economic Forum (WEF) faulted the current voluntary carbon market for a lack of transparency for investors and cited a news reports suggesting that "in some cases significant shares of end-user costs do not reach the projects and communities that so acutely need financial support." They also cited a 2022 *Wall Street Journal* headline which stated the problem more bluntly: "Middlemen Snag Carbon-Credit Cash Aimed at Peruvian Amazon."

The WEF report noted that the challenge facing the voluntary markets is to "ensure that carbon credits are a trustworthy representation of real mitigation action. The action must also be additional—that is, it would not have happened without the income from carbon credits—and permanent, and it must not result in adverse effects within or outside of its boundary".

A 2023 post about carbon offsets by Carbon Brief Interactive addressing carbon offsets stated that: "One yet-to-be published study suggests that just 12% of offsets being sold result in real emissions reductions". They go on to note that: "Projects have also been linked to Indigenous people being forced from their land and other human rights abuses".



Source: Carbon Brief

The consulting firm *Deloitte* has noted that voluntary markets face a serious challenge in the form of investor skepticism. “Carbon offsets offered by carbon standard providers have been widely criticized for overrepresenting the amount of carbon reduction they are causing,” it wrote in a 2023 report. “This impacts consumer confidence and makes it increasingly difficult to distinguish between high- and low-quality voluntary carbon credits.”

Responding to criticisms such as these, the U.S. Commodity Futures Trading Commission (CFTC) announced in 2023 that it was creating an Environmental Fraud Task Force to “focus on addressing fraud and manipulation in carbon credit markets and other forms of greenwashing, including material misrepresentations about ESG investment strategies.”

The carbon credit market, while innovative in its approach to reducing emissions, is not immune to economic and policy-related fluctuations. These changes can significantly impact the value and stability of carbon credits, thereby affecting the overall effectiveness of the carbon trading system. During periods of economic growth, there is often an increased demand for carbon credits, which can drive up prices. Conversely, in times of economic downturn, the demand for carbon credits tends to decrease, leading to lower prices. This volatility can affect the financial viability of carbon reduction projects.

Carbon Credit Fraud? And Insurance?

Two executives at CQC Impact Investors, a developer of carbon credit projects, have been indicted for alleged fraud by the U.S. Attorney for the Southern District of New York. Cases such as these are rare, but they raise questions for carbon credit buyers — how can they have confidence that their investments will help reduce greenhouse gas emissions?

Carbon credit insurance might provide an answer. Carbon credit buyers can actually insure their carbon credits with special insurance policies. Most companies, however, are unaware such policies exits.

While new insurance options are becoming available for carbon credits, a form of coverage already exists. With this insurance, a carbon credit is not sold for every ton of CO_2 a carbon project removes from, or prevents from entering, the atmosphere. Instead, 10% - 30% of the credits are set aside. These are known as a *buffer pool* and are intended to address situations where carbon that was meant to be stored or captured by the project is accidentally released into the atmosphere.

Carbon credit insurance has been available in some markets since 2013 but a number of specialist insurers have launched new programs in the past 3 years. Now established insurers are beginning to offer carbon credit policies as well. Some policies cover fraud and negligence (if the carbon project is not delivering what it claims), purchase protection (if the buyer agrees to purchase more carbon credits than are issued from a project) and buffer depletion.

Much of the activity related to insurance to date has taken place in the United Kingdom. Analysts disagree over the percentage of U.K. credit buyers currently holding insurance. Responding to one survey that asked companies if they insured their credits, 51 percent said “yes.” Others believe this figure to be much lower.

A country’s environmental policy landscape influences a company’s carbon insurance decisions, said Racheal Notto, director of carbon markets engagement at Kita, a specialty carbon insurer: “In the U.K.,

there is more rigor around how carbon credits are allowed to be used … in the US, we don't have good regulation or federal policy to push corporates to do much. It's all focused on public pressure and understanding what their clients want to see the corporate do."

Carbon credit insurance is expected to grow rapidly in the US, though.

The Bottom Line

A February 2024 article in MIT News was titled "Explained: Carbon Credits. Can carbon trading systems reduce global emissions, or are they little more than greenwashing? Clear, enforceable standards may make the difference". The article provides an interesting take on the topic of carbon credits.

Source: MIT News

Like some of the other articles cited here, the MIT article points out the pros and cons of carbon markets but does lay out some steps that can be taken to make them more effective.

While carbon credits have been widely criticized as less effective than originally hoped, they do appear to be doing some good, and efforts are underway to fix the problems that have been identified.

Carbon credits and – to a much lesser extent carbon offsets - appear to have had some impact on GHG reduction since they have been introduced, as noted earlier. There clearly have been issues – and the good news is that both government agencies and many of the companies involved in these markets – are working to address the issues and make the programs even more effective.

The data suggests that carbon credits are having an impact on the energy transition – but just not yet large enough.

Stay tuned!