



Occasional paper

Voluntary Carbon Markets

Supervisory issues



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Summary

Voluntary carbon markets (VCMs) facilitate the trade in voluntary carbon credits. These credits represent a fixed amount of carbon emission reduction achieved either through the avoidance of emissions or the removal of carbon from the atmosphere. Companies buy these credits to compensate their carbon emissions. Demand for voluntary carbon credits has been growing rapidly. An important driver for this growth is the growing number of companies that set 'net-zero' targets for carbon emissions as part of their climate action commitments.

It is important to distinguish between the voluntary carbon markets and the compliance markets for carbon emissions. In compliance markets, governments set a legal cap on the amount of carbon emissions allowed. Companies with a surplus of emission rights can then trade with companies with a deficit of emission rights. An example is the EU Emissions Trading System (ETS), which covers power generation, heavy industry and intra-EU aviation; in total about half of EU carbon emissions. The voluntary markets work very differently. Voluntary carbon credits are created by implementing projects that reduce or remove carbon emissions. There are many different types of underlying projects. Voluntary carbon markets are currently not subject to any direct government or regulatory supervision. An important implication is that there is no legal cap on the number of voluntary credits that can be created, no legal standards for the quality of these credits and no legal requirement for companies to buy these credits or use them in a certain way.

Due to this undefined legal status, it is unclear from the outset to what extent VCMs are additional to official reduction goals, such as those under the Paris Agreement, and what role they can play in global efforts to reduce carbon emissions. The growth of VCMs is accompanied by a growing number of concerns. Three categories of concerns can be distinguished: the integrity of credits, market integrity and the integrity of claims.

When it comes to the integrity of claims, a major concern is that the role of VCMs in the context of companies' 'net-zero' claims is unbalanced. The aim of the commitment to net zero under the Paris Agreement is to reduce emissions as much as possible and to use offsets only for residual hard-to-abate emissions. Because offsetting capacity is scarce, credits should not be used for avoidable emissions. However, there is a risk that companies will consider emissions 'hard to abate' in all cases where taking reduction measures is more expensive than buying voluntary carbon credits. This would shift the focus from reducing emissions to buying carbon credits, which would waste scarce offsetting capacity, both of which undermine the Paris goals. By extension, it also undermines the credibility of claims of voluntary environmental contribution that companies who buy these credits might make.

There are also concerns about the integrity of voluntary carbon credits. The concerns about the integrity of credits relate to additionality (i.e. whether credits represent a reduction that would not have occurred without the funding of those credits) as well as leakage and permanence issues. These quality concerns make it problematic to use voluntary carbon credits in the accounting-like net-zero framework in which emissions and carbon credits can be equally matched. Conceptually, certain emissions and more uncertain offsets should not be placed on an equal footing.

Market integrity issues include a lack of standardisation of carbon credits, which makes it difficult to determine a fair price. Furthermore, there are no safeguards to prevent possible conflicts of interest between stakeholders like project developers, brokers, traders and end users. This could lead to incentives to maximise the supply of credits instead of quality throughout the value chain. Finally, there are concerns about the untransparent role of intermediaries.



Although VCMs are unregulated, they are nonetheless linked to the regulated financial sector. The most direct link is the trade in carbon derivatives, which qualify as financial instruments. Furthermore, there is growing involvement of regulated financial institutions, such as banks, in voluntary carbon markets. Finally, companies subject to the Corporate Sustainability Reporting Directive (CSRD) that make net zero claims are subject to supervision of their reporting and corresponding audits.

The integrity of net-zero claims is the focal point of our supervisory view. We take the view that companies that claim to be net zero should be fully transparent about their path to net zero. Carbon credits can play a role in these claims, but this role is limited and should not distract from reduction efforts. Companies should be transparent about how they use carbon credits, how these credits relate to their emission reduction efforts, and about how they take into account uncertainties around the reduction outcome of the credits. In general, strong quantitative claims should not be based on uncertain carbon credits.

In addition, (international) efforts to improve credit quality and market integrity remain important, and the AFM supports and where possible contributes to these efforts. Nevertheless, it is hard to see how all the concerns can be addressed in a voluntary framework. Given the need to drastically reduce emissions in a short span of time, ambiguity regarding the certainty of emission reduction needs to be avoided. This ambiguity is probably best addressed within the compliance market, underpinned by a legal framework.



Samenvatting (summary in Dutch)

Nederlandse samenvatting van 'Voluntary carbon markets: a supervisory view'

De vrijwillige CO₂-markt faciliteert de handel in zogeheten 'vrijwillige carbon credits'. Deze credits vertegenwoordigen een vaste hoeveelheid CO₂-emissiereductie, die is gerealiseerd door ofwel het voorkomen van CO₂-emissies ofwel het uit de lucht halen van CO₂. Bedrijven kopen deze credits om hun CO₂-uitstoot te compenseren. De vraag naar vrijwillige credits groeit sterk. Een belangrijke oorzaak hiervoor is het toenemend aantal bedrijven dat zogeheten 'netto-nul' of 'net-zero' doelen stelt met betrekking tot hun CO₂-uitstoot, als onderdeel van hun klimaatplannen.

Het is belangrijk om onderscheid te maken tussen de vrijwillige en verplichte markt voor CO₂-uitstoot. In de verplichte markt, stelt de overheid een limiet op de maximale uitstoot die is toegestaan. Bedrijven met een overschot aan uitstootrechten kunnen dan handelen met bedrijven met een tekort aan rechten. Een voorbeeld is het Europese emissiehandelssysteem (ETS), dat van toepassing is op elektriciteitsproductie, zware industrie en intra-Europese luchtvaart. Het Europese ETS dekt ongeveer de helft van de CO₂-uitstoot in de EU. De vrijwillige markt werkt heel anders. Hier worden op particulier initiatief carbon credits gecreëerd door projecten uit te voeren die CO₂-uitstoot verminderen of CO₂ uit de lucht halen. Die projecten zijn heel divers van aard. De vrijwillige CO₂-markt valt niet onder regelgeving of wettelijk toezicht. Dat betekent dat er geen limiet is op de hoeveelheid credits die kunnen worden gecreëerd, er geen juridische eisen aan de kwaliteit van deze rechten worden gesteld en dat er geen verplichting is voor bedrijven om deze rechten te kopen of op een voorgeschreven manier te gebruiken.

De onduidelijke juridische status maakt het onduidelijk welke rol deze credits kunnen spelen in de wereldwijde inspanning om de CO₂-uitstoot te verlagen. Zo is er discussie over in hoeverre de reducties die op basis van vrijwillige credits worden gerealiseerd, additioneel zijn aan de officiële doelen voor emissiereductie die overheden zijn overeengekomen in het Akkoord van Parijs.

De groei van de van vrijwillige CO₂-markt gaat gepaard met een aantal zorgen, die in te delen zijn in drie categorieën: integriteit van de credits (zijn de credits van goede kwaliteit), integriteit van de markt (verloopt de handel in credits transparant en eerlijk) en integriteit van claims (zijn de claims die onderbouwd worden met vrijwillige carbon credits gegrond en transparant).

Een belangrijke zorg ten aanzien van de integriteit van de claims heeft betrekking op de rol die de vrijwillige CO₂-markt speelt in de context van 'net zero' claims. De bedoeling van het Akkoord van Parijs is om de prioriteit te leggen bij het zoveel mogelijk terugbrengen van de uitstoot. Alleen voor de resterende, moeilijk te reduceren ('hard-to-abate') uitstoot zouden compensatie-instrumenten, zoals vrijwillige carbon credits, ingezet moeten worden. De capaciteit voor uitstootcompensatie is beperkt en daarom moet deze eigenlijk niet worden gebruikt voor vermijdbare uitstoot. Het risico bestaat dat bedrijven alle CO₂-uitstoot waarvoor geldt dat zelf reduceren duurder is dan het kopen van vrijwillige carbon credits, gaan beschouwen als 'moeilijk te reduceren'. Hierdoor verschuift de aandacht van het terugbrengen van eigen emissies naar het kopen van credits en dreigt bij voorbaat schaarse compensatiecapaciteit verspild te worden die we in de toekomst nog hard nodig hebben. Dit ondermijnt de doelen uit het Akkoord van Parijs en doet afbreuk aan de geloofwaardigheid van klimaatgerelateerde claims die bedrijven doen op basis van vrijwillige credits.



Daarnaast spelen zorgen over de integriteit van de credits. Hiermee doelen we onder meer op de kwaliteit van de projecten die aan de vrijwillige carbon credits ten grondslag liggen en de monitoring van de reducties die gerealiseerd worden. Een belangrijk zorgpunt heeft betrekking op additionaliteit: vertegenwoordigt de vrijwillige carbon credit een CO₂-reductie, die zonder deze credit niet tot stand was gekomen? Daarnaast zijn er zorgen over weglekeffecten en mogelijk tijdelijkheid van de reductie. De huidige kwaliteitsproblemen zorgen ervoor dat vrijwillige credits niet geschikt zijn om te worden gebruikt in het boekhoudkundige denken dat ten grondslag ligt aan 'net zero', waarin eigen uitstoot en aangekochte credits tegen elkaar kunnen worden weggestreept. De zekere aard van de eigen CO₂-emissies tegenover de onzekere aard van CO₂-compensatie via credits, zorgt ervoor dat deze niet aan elkaar gelijkgesteld kunnen worden.

De problemen op het terrein van marktintegriteit hebben onder andere betrekking op een gebrek aan standaardisatie van vrijwillige carbon credits, die het moeilijk maakt om een eerlijke prijs vast te stellen. Daarnaast ontbreekt het aan waarborgen om belangenverstrengeling te voorkomen tussen projectontwikkelaars, brokers, handelaren en eindgebruikers. In de hele waardeketen ontstaan hierdoor prikkels om vooral zoveel mogelijk credits uit te geven, in plaats van een goede kwaliteit na te streven. Tot slot zijn er vragen over de rol die intermediairs in de keten spelen, bijvoorbeeld met betrekking tot het gebrek aan transparantie over de tarieven die ze in rekening brengen.

Hoewel vrijwillige CO₂-markten niet gereguleerd zijn, zijn er wel raakvlakken met de gereguleerde financiële sector. Het duidelijkste raakvlak betreft handel in derivaten van CO₂-rechten, die kwalificeren als een financieel product en daarmee onder toezicht staan. Daarnaast is er toenemende betrokkenheid van gereguleerde financiële instellingen, zoals banken, bij de vrijwillige CO₂-markten. Tot slot hebben bedrijven die vallen onder de Corporate Sustainability Reporting Directive (CSRD) en 'net zero' claims doen te maken met toezicht op hun verslaggeving daarover en de daarbij behorende accountantscontrole.

Binnen de toezichtvisie van de AFM op de vrijwillige CO₂-markt, ligt de nadruk op de rol die deze markten spelen in de integriteit van 'net zero' claims. Het is van belang dat ondernemingen die 'net zero' claimen transparant zijn over de weg daarnaartoe. Vrijwillige carbon credits kunnen hierin een rol spelen, maar deze rol moet beperkt zijn en niet afleiden van inspanningen om de uitstoot te reduceren. Ondernemingen moeten transparant zijn over hoe deze credits worden ingezet in het kader van hun net-zero claims en hoe ze omgaan met de onzekerheden die met vrijwillige credits gepaard gaan. In het algemeen geldt dat sterke kwantitatieve claims over het terugdringen CO₂-uitstoot niet zouden moeten worden onderbouwd met onzekere vrijwillige credits.

Daarnaast blijven de (internationale) inspanningen om de kwaliteit van de carbon credits en de integriteit van de handel in deze credits te verbeteren belangrijk. De AFM ondersteunt deze inspanningen en draagt er waar mogelijk aan bij. Niettemin lijkt het lastig om alle zorgen die spelen in deze markt te adresseren binnen het kader van 'vrijwilligheid'. Gegeven de noodzaak die uitgaat van 'Parijs' om in korte tijd tot een drastische emissiereductie te komen, moet onduidelijkheid over middelen en tempo waarmee reductiedoelstellingen kunnen worden gerealiseerd zoveel mogelijk worden voorkomen. Deze onduidelijkheid wordt waarschijnlijk het beste tegengegaan binnen de kaders van een verplichte markt, waarin heldere juridische uitgangspunten gelden.



01 Introduction



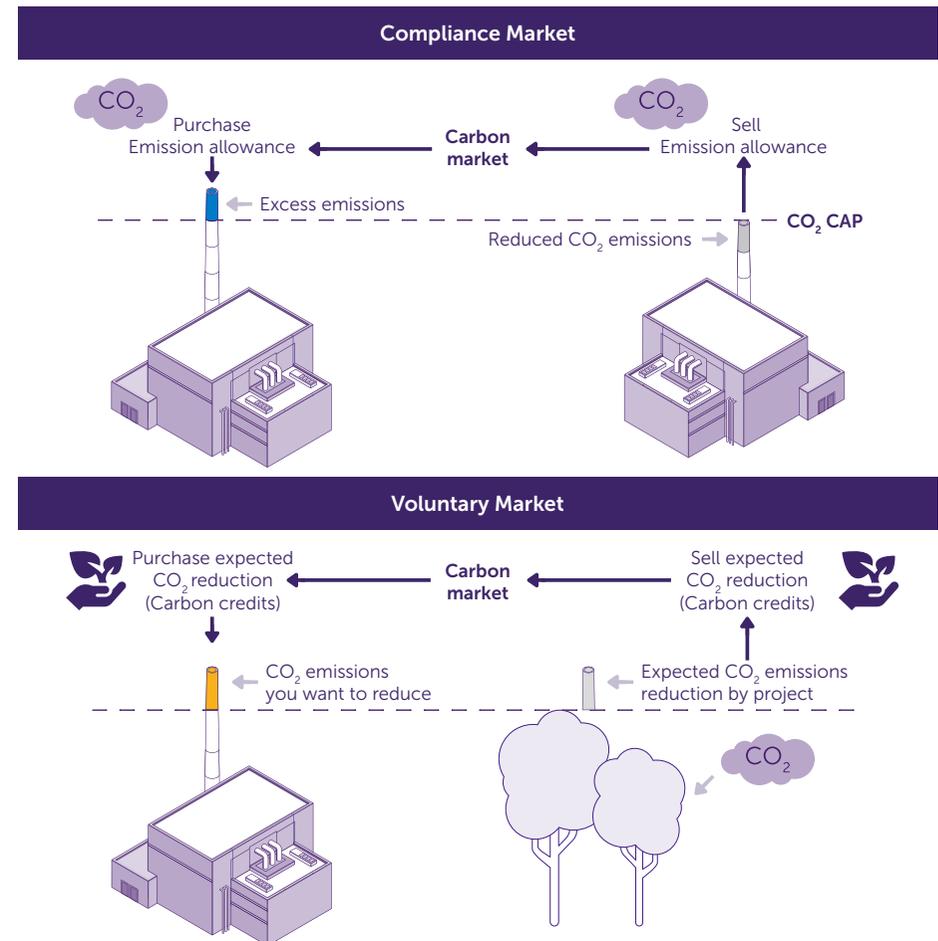
1.1 What are voluntary carbon markets?

Voluntary carbon markets are markets for trading in voluntary carbon credits.

Voluntary carbon credits are tradable credits that represent a fixed amount of carbon emission reduction, achieved either through the avoidance of emissions or the removal of carbon from the atmosphere. These credits can be bought by parties that seek to offset their carbon emissions and reduce their 'net' carbon footprint.

The defining feature of voluntary carbon markets is their voluntary basis. In addition to voluntary markets there are also compliance markets. In compliance markets (such as the EU Emissions Trading System (EU ETS)), carbon emitting parties tend to get a carbon allowance and a legal obligation to limit their emissions to the amount permitted by the allowances they have. These allowances can be traded between parties with surplus allowances and parties with insufficient allowances to cover their emissions (cap-and-trade system; figure 1). In the voluntary market no such legal obligations exist and credits are being bought by parties that seek to offset their emissions beyond any legal requirements to which they might be subject. An important implication of is that there is no legal cap or limit on the amount of voluntary credits that can be created, so more reduction/removal projects lead to more available credits (baseline-and-credit system).

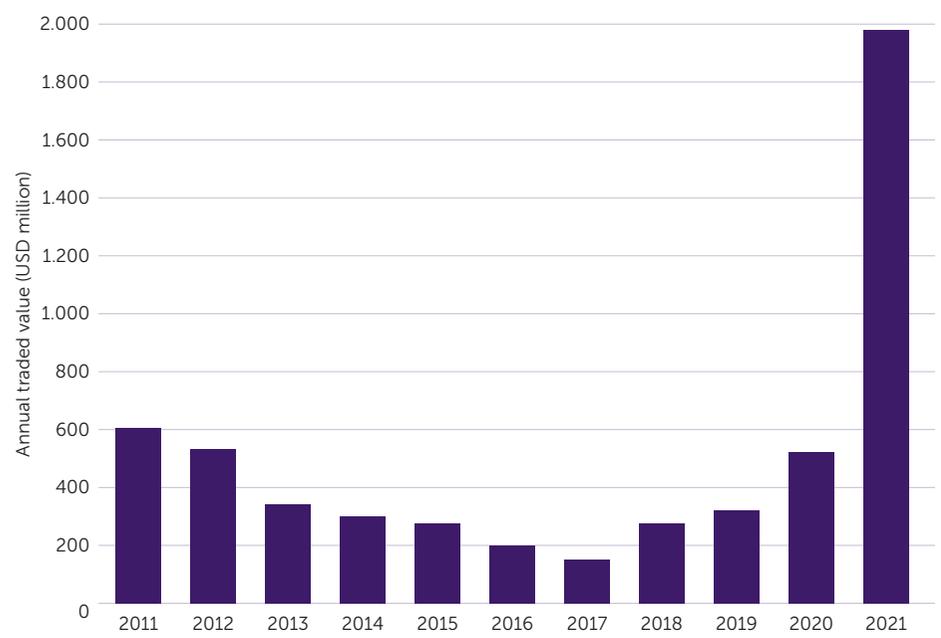
Figure 1. Compliance versus voluntary carbon markets





While the voluntary carbon credit market has been growing rapidly, it remains relatively small compared with compliance schemes. The total traded value on voluntary carbon markets reached nearly USD 2 billion in 2021 (figure 2). Although this is a steep rise compared with previous years, it remains small compared with compliance markets. In 2021, for example, 15.2 billion tonnes of EU ETS carbon allowances were traded on Intercontinental Exchange (ICE), compared with 362 million tonnes of voluntary credits worldwide ([World Bank, 2022](#)). Given the growing number of companies with net-zero commitments, the size of voluntary carbon markets is expected to grow further. The Taskforce for Scaling Voluntary Carbon Markets (TSVCM) estimates that demand for carbon credits could increase by a factor of 15 or more by 2030 and by a factor of up to 100 by 2050. Depending on different price scenarios, the market size in 2030 could be between USD 5 billion and USD 30 billion at the low end and more than USD 50 billion at the high end ([TSVCM, 2021](#)).

Figure 2. Market for voluntary carbon credits is growing



Source: [Ecosystem Marketplace, 2022](#)

1.2 Origin

Voluntary carbon markets find their origin in the Kyoto protocol established in 1997. The Kyoto protocol introduced binding commitments to reduce emissions. Because the marginal cost of reducing carbon emissions or removing carbon from the atmosphere varies from country to country, but the marginal benefit for the planet is the same, trade in emission reduction credits could in theory reduce the overall cost of emission reduction. Therefore, the Kyoto protocol introduced the so-called ‘flexible mechanisms’. These flexible mechanisms, the Clean Development Mechanism (CDM) and Joint Implementation Projects (JI), were meant primarily to allow developed countries to meet their reduction targets by investing in emission reduction in developing countries.

While the flexible mechanisms can be seen as a compliance market, they form the foundation of the voluntary market. Demand from outside the framework of the Kyoto protocol, ineligibility of certain activities in the CDM, the high administrative burden of the CDM and concerns about the quality of CDM projects led to the creation of other carbon trade schemes wholly outside of the Kyoto framework. These were the first voluntary markets. This evolution has been an important factor, as many of the relevant measurement and validation techniques originally developed for the CDM were absorbed in these new schemes and further built upon.

The Paris Agreement has opened up new possibilities for the use of voluntary credits in official emission reduction targets. Article 6 of the 2015 Paris Agreement describes the basis for international cooperation and the carbon trade. More specifically, Article 6.4 in principle provides a framework allowing governments to buy voluntary credits to meet their official targets. The premise is that the cost of decarbonising can be reduced by financing carbon credits in the lowest-cost locations, while the environmental benefits are the same. A lower cost might also result in countries setting more ambitious National Determined Contribution (NDC) targets.



Article 6 (more specifically Article 6.4) essentially creates a market where public and private actors participate in countries' reduction efforts by financing projects.

However, reaching agreement on the details proved thorny. The high-level principles of Article 6.4 proved to be contentious, leading to delays in implementation. A key question concerned double counting. For Article 6.4 to be truly additional, an international transfer of a credit needs to be accompanied by a corresponding adjustment of the reduction goals of the originating country. Otherwise, both the originating and destination country would count the same carbon reduction ([Abatable, 2022](#); [Carbon Market Watch, 2020](#)). Agreement on these corresponding adjustments and other contentious issues, such as the integration of existing CDM credits, was only reached at the 2021 COP26. A key question going forward is what type of credits (i.e. avoidance, reduction or removal) will qualify and whether this will include existing voluntary credits like Verra and Gold Standard (see section 1.3). An '[Article 6.4 Supervisory Body](#)' is currently working on these questions. It is not expected that any credits will be issued or traded on the basis of Article 6.4 before 2024. Future decision-making will determine the role of private actors within a country's NDC ambitions and will therefore have a major influence on the role and scope of voluntary markets ([Abatable, 2022](#)). A first example of the 'official' use of carbon credits is legislation in Singapore that will allow companies to offset up to 5% of their taxable carbon emissions with voluntary credits from 2024. The Singapore authorities are currently working on a list of eligible host countries, carbon standards and methodologies ([Straits Times, 2023](#)).

1.3 The carbon credits mechanism

Voluntary carbon credits are created by implementing projects that reduce carbon emissions or remove carbon from the atmosphere. The idea is that anyone can implement a project that reduces carbon emissions (relative to a benchmark) or removes carbon from the atmosphere. In exchange for the reduction/removal, the entity sells carbon credits, for which it receives cash to realise the reduction/removal project. Hence, the life cycle of a carbon credit starts with a project developer's initiative to reduce carbon emissions or remove carbon from the atmosphere in exchange for cash.

Independent standard setters play a central role in the lifecycle of a carbon credit.

Obvious concerns around carbon reduction/removal are the quality of the project, the amount of carbon that is reduced or removed and the prevention of double counting. Therefore, independent standard setters have emerged that set out the exact process, methodology and criteria that need to be met to create carbon credits under that particular standard. Standards place a lot of emphasis on methodology (the exact details of how the carbon reduction is realised and measured) and independent verification by accredited auditors. Finally, standard setters also manage central registries of carbon credits aimed at preventing double counting.

A small number of standard setters dominate the market. Although in theory carbon markets are unregulated and anyone could create carbon credits, the market has become dominated by a few large standard setters. By far the largest is Verra, with an estimated market share upwards of 70%. Gold Standard is another important standard setter, with a market share of about 15%. There are various others, including the Climate Action Reserve and American Carbon Registry.

The general process for the creation of a carbon credit is: plan, implement and validate the reduction/removal project and subsequently issue, trade and retire the carbon credit.

The creation of a carbon credit is strongly connected to the implementation of the underlying reduction/removal project. The general process for the implementation of a reduction/removal project and associated life cycle of a carbon credit is outlined in figure 3. This description is based on the procedures and terminology of Gold Standard, but the general steps for other standards are similar. Parameters that can vary between standards are the criteria set out in the specific methodology and the strictness, quantity and thoroughness of independent validation steps. The general steps are as follows:

- The first milestone for a given project is the project *design document*. The project design document outlines the general idea of the project, the relevant methodology of the standard setter to be used and, under most standards, must include stakeholder consultation to ensure the project does not harm local communities.
- The project design document is validated by an *accredited auditor* (sometimes referred to as the 'Designated Operational Entity'). The accreditation is issued by the independent standard setter. The auditor verifies that the project design is



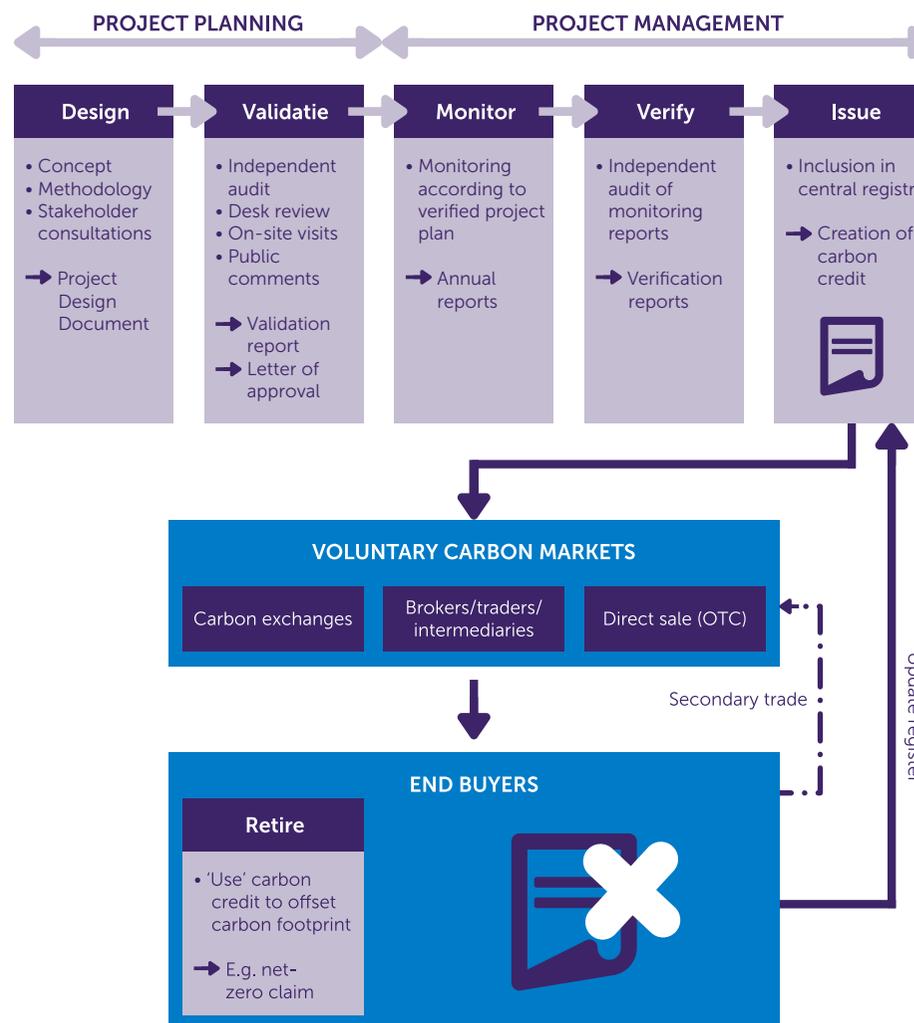
in accordance with the relevant methodology (especially on quality aspects like additionality and permanence), is likely to achieve the projected amount of carbon reduction and has no other harmful effects. At this point, approval is obtained from the standard setter and the implementation of the project can start.

- During the implementation of the project, the project developers issue *monitoring reports* regarding the progress of the project and specifically regarding the amount of carbon reduced.
- The monitoring reports are also *independently validated* by an accredited auditor. In most cases, this has to be another auditor than the one that validated the design document.
- Provided everything is order, this completes the process of *certification*, and the standard setter now *issues* the carbon credits by including them in the registry.

Issuance of credits can be a one-off or continuously during the operational phase of the project. How the carbon credits are issued depends on the specific project.

Issuance of carbon credits can be frontloaded, backloaded or distributed over the life cycle of the project, depending on the nature of the project. Note that there can be a significant delay between the reduction of carbon emissions and the creation of the credits; this can be months or even years. This is an important factor in the project developer's financial management.

Figure 3. Overview of the voluntary carbon credits mechanism





There are many different types of carbon credits. Various categorisations are in use. One main distinction is reduction versus removal credits. Reduction credits aim to reduce emissions that would otherwise have taken place, while removal credits aim to sequester carbon from the atmosphere. Another distinction is between nature-based and technology-based credits. Nature-based projects aim to manage, restore or protect nature to reduce or remove emissions. Technology-based credits are based on technologies like carbon capture and storage or direct air capture. Ecosystem Marketplace, one of the monitors of the market, has a taxonomy of 170 different project types, which are categorised in eight main categories:

Figure 4. Eight categories of project types

Category	Examples
Forestry and land use	Preventing deforestation Carbon storage in marine systems
Renewable energy	Replacing fossil energy sources with renewable sources
Household and community	Clean water projects Lighting efficiency
Chemical/industrial	Nitric acid reduction/destruction Carbon capture and storage
Energy efficiency	Increasing energy efficiency of factories
Waste disposal	Recycling Waste gas recovery
Agriculture	Grassland management Livestock methane
Transport	Increasing shipping efficiency Public transport projects

Source: [Ecosystem Marketplace, 2022](#)

The issued carbon credit can be traded, either directly or through intermediaries.

Both OTC trade and centralised platforms exist in carbon trade. Given the lack of a unified standard, OTC trade plays a large role. There are also intermediary traders that try to arbitrate different markets or simply speculate on future price increases. It is also possible for project developers to sell to end buyers directly, without any intermediary trade. Finally, derivatives trading based on carbon credits has emerged, mostly in the form of futures. These markets are still in their infancy, however.

Finally, the end buyer needs to retire the credit to 'use' it in any offsetting claim.

For the end buyer to be able to actually offset their own emissions and claim a lower net emission, the carbon credit needs to be 'retired'. When a credit is retired, it is taken out of circulation and cannot be traded again. It does not suffice to buy a credit to offset carbon emissions, as it can still be resold and would result in double counting. Hence, a carbon credit can be traded multiple times but can only be retired once. Retirement of credits needs to be registered in the standard setter's central registry.

1.4 Carbon credit trade and market intermediaries

Carbon credits are traded both OTC and via intermediaries. Once projects have been certified, the certification standard body will issue credits (see section 1.3). Issued credits may be purchased, traded and sold to buyers, either over the counter (OTC) or through intermediaries, in either primary or secondary markets. Most voluntary carbon credits are traded OTC ([ISDA, 2021](#)). OTC trade enables credit buyers to engage directly with project developers at any point in the process, from the development of the methodology through to after credits have been issued. This helps credit buyers to gain a more in-depth understanding of the offset project and safeguards the quality of the purchased credits. In addition, skipping intermediaries such as brokers or retailers may give buyers access to lower prices. However, in a dispersed market like that for voluntary carbon credits, where it is hard for sellers to find buyers and hard for buyers to get an overview of who is selling what and at what price, intermediaries can play a valuable role ([Carbon Market Watch, 2023](#)). The main categories of intermediaries are described below.



As in other (commodity) markets, there are brokers and retail traders that link supply and demand. Brokers procure offset credits and then transfer them on clients' behalf. Brokers can make it easier to identify a mix of offset credits from different project types and facilitate large or small transactions. Some brokers sell offset credits from projects they have invested in, in addition to projects developed by others. This practice may provide efficiencies in pricing, but it can affect the ability of the broker to be impartial about the credits they sell ([Carbon Offset Guide](#)). Brokers are traditionally investment banks, although other market participants also act as brokers, including investment funds as well as speculators that purchase and sell emission reductions to take advantage of market-price distortions and arbitrage possibilities ([IOSCO, 2022](#)). Retail traders purchase large amounts of credits directly from the supplier and bundle those credits into portfolios, ranging from hundreds to thousands of equivalent tonnes of CO₂, and sell those bundles to the end buyers, typically with some commission added ([S&P, 2021](#)).

Another option to trade credits is through exchanges, which act as platforms that connect sellers and buyers. At present, the largest exchanges for carbon credits include the New York-based Xpansiv CBL and Singapore-based AirCarbon Exchange (ACX) ([S&P, 2021](#)). Exchanges aim to simplify and speed up the trade in carbon credits – which have a high level of complexity due to the many factors affecting their price – by creating standard products that ensure some basic specifications are respected, such as the type of underlying project, a fairly recent vintage and a certification from a restricted group of standards ([Carbon Offset Guide](#)).

With the growth in demand for derivative products linked to carbon credits (such as standardised contracts for future delivery), major established derivatives exchanges in the United States and Europe have announced plans to scale up their activities in the voluntary carbon market. In the US, for example, CME and Nodal Exchange listed voluntary carbon offset derivatives contracts in June 2022. In Europe, the European Energy Exchange (EEX) launched a VCM trading platform in 2022 and the London Stock Exchange recently launched a Voluntary Carbon Market that facilitates the public listing of carbon funds. ICE Futures Europe has also launched futures contracts based on carbon credits.¹ ([IOSCO, 2022](#)).

¹ For press releases on these initiatives see: [EEX, 2022](#); [CME Group, 2021](#); [ICE, 2022](#); [LSEG, 2022](#)

The use of blockchain technology is emerging within the intermediary chain.

Blockchain technologies are beginning to be explored for use in VCMs. Crypto operations retire carbon credits in the VCM registries and transform these into tokenised carbon credits, using blockchain technology. This is basically a repackaging exercise, as it does not change the underlying nature and quality of the carbon credit. It does however enable a new public (crypto actors) to purchase these units ([IOSCO, 2022](#), [Carbon Market Watch, 2023](#))

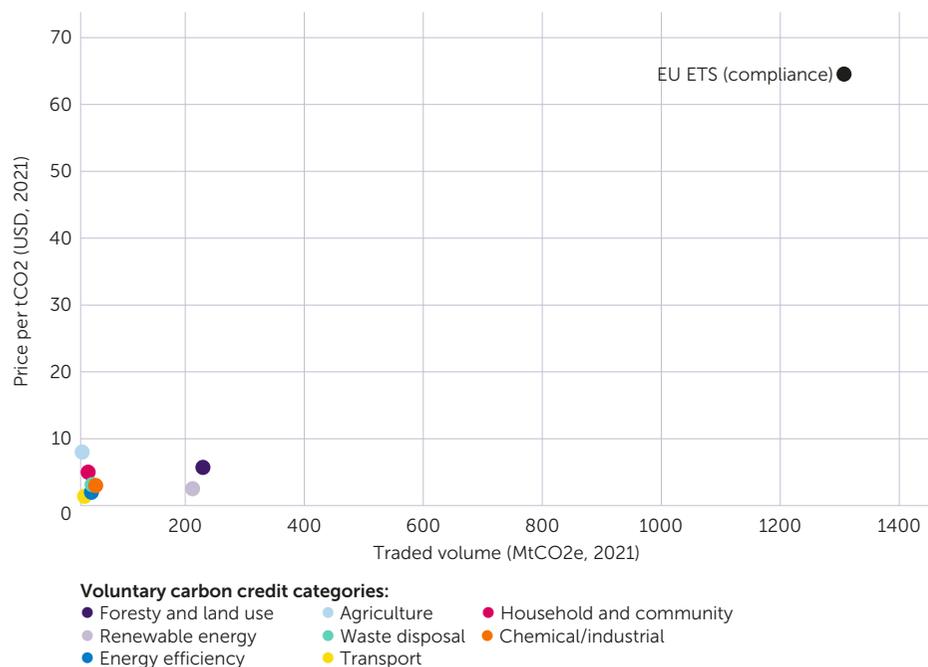
1.5 Carbon credit pricing

Prices of voluntary carbon credits vary widely and are far below prices in the compliance market. Prices in the voluntary carbon market are influenced by vintage, quality, certifications, negotiating power and risk. Carbon credits of different origins and quality have very different prices, ranging from a few cents per megatonne of CO₂ equivalent (MtCO₂e) to USD 20 per MtCO₂e ([VCM Primer, 2021](#)). As the market expands in volume and becomes more liquid, more standardised price setting methods are likely to emerge, and the growing number of exchanges, credit ratings and indices is expected to lead to more transparent carbon pricing ([TSVCM, 2021](#)). In any case, prices are far below the compliance market, at least in the EU (figure 5). This raises questions about quality and transparency and to what extent the pricing dynamic is underpinned by real-world costs to reduce carbon emissions and real-world demand for carbon emission reduction. Critics are concerned that relatively cheap voluntary carbon credits will make it less necessary for companies to reduce their own emissions; apart from their compliance obligations, companies are more likely to opt for relatively cheap carbon credits instead of actually improving the sustainability of their business operations.





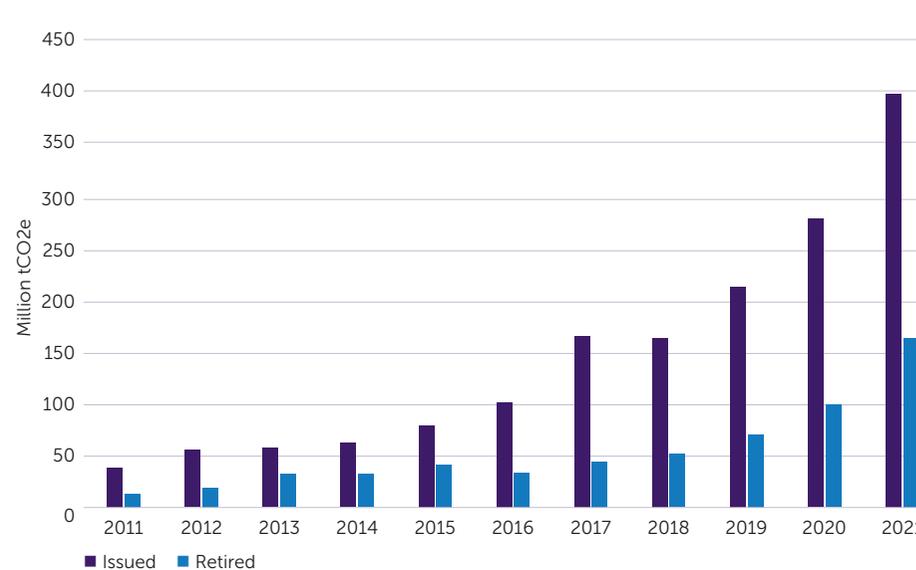
Figure 5. Prices of voluntary credits are lower than the compliance market price



Source: [Ecosystem Marketplace \(2022\)](#), [EEA](#), [ING \(2022\)](#)

There is now a surplus of carbon credits on the market. Issuance of carbon credits has long outpaced retirements and the surplus of credits increased dramatically in recent years (Ecosystem Marketplace; see figure 6). If this increasing surplus is not matched by an increase in retirements, this could put downward pressure on prices going forward. It is unclear what causes retirements to lag behind. It could be that buyers are hoarding credits because they might need to compensate emissions in the future more than now, or they might be speculating on higher prices in the future.

Figure 6. Increasing surplus of carbon credits



Source: [Ecosystem Marketplace, 2022](#)



02 Concerns

There are various concerns around voluntary carbon markets. These concerns can be categorised along the lines of the VCM value chain: (i) integrity of credits; (ii) market integrity; (iii) integrity of claims (figure 7). This section describes these three categories in more detail.

Figure 7. Three categories of concerns



2.1 Integrity of credits

The main criticism of carbon credits concerns additionality, i.e. whether the credits represent a reduction of a given amount of carbon emissions which would not have occurred without the funding of those credits. The additionality is usually calculated as a deviation from the emissions in a baseline scenario. This is a complex calculation where human judgment plays an important role. Standard setters have developed extensive methodologies for how to establish a credible baseline and reliably measure carbon emission reduction. These methodologies vary in their leniency for judgment and are the subject of ongoing debate. There have been many (recent) examples and scandals where projects did not achieve the advertised reduction, or where that reduction would have occurred anyway if no

carbon credits had been issued ([The Guardian, 2023](#); [FTM, 2023](#)). Earlier studies of voluntary mechanisms also found serious issues in relation to additionality ([Carbon Market Watch, 2018](#); [Öko-Institut, 2016](#)). In any case, especially for credits based on deforestation prevention or energy savings, it is hard to objectively prove that the emission reduction would not have occurred otherwise.

A related concern is leakage. Leakage refers to the shift of pollution activity to another area. For example, when a farmer who issues a carbon credit for growing trees on his farmland simply relocates his agricultural activities to another area. While the issued carbon credit might strictly speaking represent a reduction in emissions, the total net contribution of the farmer's activities to the reduction of emissions may be zero or even negative.

Another line of criticism concerns the permanence of the emission reduction. Not all emission reduction is permanent. With deforestation prevention, for example, tree growth sequesters carbon from the atmosphere over a long period. Typically, carbon credits guarantee sequestration for up to thirty years. However, if the forest is logged or burnt down afterwards, the carbon emissions are (re)released into the atmosphere and the net contribution of the credit is lost.

Finally, double counting can be an issue, especially if carbon credits are traded internationally. An obvious source of double counting is when multiple carbon credits are issued for the same project. Since there are multiple standards and there is no unified register, this is a real possibility. Double counting can especially occur when carbon credits are traded internationally. If a credit based on a project realised in country A is sold to a buyer in country B, country A should not claim the reduction towards their national contribution and should therefore adjust for this transaction. This does not happen automatically, so most standard setters include this as an explicit requirement.



2.2 Market integrity

A major issue for market integrity is the lack of standardisation of voluntary carbon credits. A carbon credit can represent wildly different projects in different sectors and countries. In addition, different standard setters can apply different underlying methodologies to determine the amount of carbon emission reduced. Furthermore, the lack of granular data for these projects makes it difficult to establish a price. This is reflected by very different prices for different kinds of credits. There are various international initiatives to standardise voluntary carbon credits, and the fact that a few standard setters now dominate the voluntary carbon markets has boosted this trend, but major differences still remain. This inhibits the further development of markets.

Carbon markets have various participants and conflicts of interest may emerge. An obvious source of a conflict of interest is between traders and investors. Traders may have an incentive to issue buy or sell recommendations to their customers, while doing the opposite with their own position. Another conflict of interest is the fact that major buyers of credits are also involved in project development, possibly to hedge against future price rises and to ensure supply in the long run ([S&P, 2021](#)). In addition, both standard setters and project developers have an incentive to create carbon credits, and the remuneration schemes are not transparent. This creates a market dynamic where all stakeholders have an incentive to maximise the supply of credits rather than the quality of the credits.

There is no regulatory framework to regulate the issuance, trade in and governance of carbon credits. Although the market is dominated by a few standard setters, carbon credits are not regulated and in theory anyone could issue a carbon credit. There are no minimum standards or requirements, neither for issuing nor for trading in carbon credits. Furthermore, there are no required safeguards to manage potential conflicts of interest. The legal treatment of carbon credits also varies from country to country; some countries qualify voluntary carbon credits as traded instruments (US), while others do not (EU, Japan) ([IOSCO, 2022](#); [ISDA, 2022](#)).

A general concern is the role of the intermediary value chain. To issue and trade a carbon credit, many intermediary parties are required, e.g. the standard setter, auditors, traders, exchanges and financiers. This raises the question to what extent money intended to reduce carbon emissions actually ends up with the project and how much 'stays behind' in the value chain. As schemes are not transparent, this is difficult to determine, which makes it hard to judge how efficient carbon markets actually are. Recent research shows that the level of remuneration may be significant and could be more than 100% of the funding received by the project developers ([Carbon Market Watch, 2023](#)).

2.3 Integrity of claims

In response to the Paris Agreement, companies have begun to set climate targets and net-zero targets in particular. To limit global warming to no more than 1.5°C as called for in the Paris Agreement, emissions will need to be reduced by 45% by 2030 compared with 2010 levels and reach net zero by 2050. Even though it is up to governments to set the regulations to make this possible, companies have begun setting their own climate targets. Net-zero targets in particular have become the dominant frame for voluntary corporate climate action (box 1). As of 2020, 19% of companies on the Forbes 2000 list had a net-zero target and 27% companies had other climate and emission reduction targets ([Axelsson et al., 2022](#)). The growing number of net-zero pledges is considered a main driver for the growth of the market for voluntary carbon credits ([ISDA, 2021](#); [World Bank, 2022](#)).



Box 1. Net-zero commitments

Net zero is essentially an accounting mechanism for a company's carbon footprint. The credits column shows the tonnes of carbon dioxide and carbon dioxide equivalents (for other greenhouse gases like methane and nitrous oxide) that a company produces through its direct (Scope 1) and indirect activities (Scope 2) as well as its supply chain (Scope 3). In the debits column, emissions that cannot be immediately reduced by the company can be offset by paying someone else to take an equivalent amount of carbon out of the atmosphere. A company, country, or individual is said to be net zero when the debits equal the credits (BCG, 2022).

What and how to offset is major challenge in defining net-zero strategies. Evaluating what to offset involves a process of defining which emissions can be reduced and which are residual and appropriate to offset. Some companies use a marginal abatement cost threshold to define what specific emission sources they would consider hard to abate and would therefore consider offsetting. Others avoid making concrete projections by waiting until the 2030s to find out what they will struggle to decarbonise before deciding on actual investments in offsets (Axelsson et al., 2022). The next step is to decide how to offset. This could involve either direct investment in offsetting projects or, most commonly, buying credits on the voluntary carbon markets (the topic of this paper).

Climate-related reduction targets are not straightforward. The targets that companies set vary widely in terminology used, emissions covered (scope) and target years. In practice, net zero and carbon neutrality are used as synonyms, though from a scientific perspective the terms differ. Corporate climate pledges also vary widely in terms of coverage. Whereas some companies set climate targets that cover all scope 1, 2 and 3 emissions, others commit to reduce scope 1 and 2 emissions only. Research supports the observation that a wide range of terms is used by companies regarding their climate targets (New Climate Institute, 2021; World Bank, 2022). This can cause confusion for companies, consumers and those who aim to hold companies to account.

Many companies give insufficient insight in their strategies to reach climate targets. A recent study by the AFM found that half of the companies reviewed gave insufficient information on how they are going to achieve their climate targets (AFM, 2023). The AFM also looked into press releases and prospectuses of a number of listed companies and found that these contain hardly any information to support their net-zero claims or on their progress towards reaching net zero. Reviews of net-zero pledges by Carbon Market Watch (2023) and New Climate Institute (2022) also provide evidence that companies fall short in presenting precise and publicly accessible plans to underpin the pathway towards their ambitious targets.

The aim of the commitment to 'net zero' under the Paris Agreement is to reduce emissions as much as possible and to offset any residual hard-to-abate emissions with carbon credits. In general, the Paris Agreement implies emissions have to be fully reduced and this should be the main focus of corporate climate efforts (UN, 2022; World Bank, 2022). However, there are 'hard-to-abate' residual emissions that are not feasible or possible to reduce. These can be compensated by reducing carbon emissions elsewhere, which would result in a 'net-zero' position. This compensation is achieved by buying and retiring carbon credits and is the main foundation for trade in carbon credits. It is important that carbon offsetting is limited to the residual hard-to-abate credits. First of all because net-zero pathways that delay emission reduction come with greater uncertainties, higher adaptation needs and risks of sudden shocks (Green Climate Fund, 2021). And secondly because the capacity to remove carbon from the atmosphere is limited and should not be used for avoidable emissions (Greenpeace, 2021). This also implies that carbon reduction and carbon offsets should not be treated as equal.

The use of carbon credits in the context of net-zero claims appears unbalanced. There is no common framework for determining which emissions are hard to abate. The main concern is that companies will consider emissions 'hard to abate' in all cases where taking reduction measures is more expensive than buying voluntary carbon credits. As voluntary carbon credits are much cheaper than compliance credits, this would shift the focus from reducing emissions to buying carbon credits. That would undermine the goals of the Paris Agreement (SEI, 2021). Furthermore, the extent to which companies have concrete plans to achieve their targets varies greatly (Axelsson et al., 2022; UN, 2022; Carbon Market Watch, 2023). The concern here



is that companies will implicitly or explicitly hedge their commitment to reducing carbon emissions by leaving open the possibility of buying carbon credits in the future.

Carbon credits do not fit with the accounting-like nature of the net-zero

framework. In a net-zero framework, carbon reduction is viewed as an accounting exercise in which emissions can be exactly matched by retiring carbon credits. This approach is problematic for a number of reasons. Firstly, as outlined in section 2, carbon credits lack the quality and precision needed for this kind of offsetting. Given the concerns around baselines and additionality, one should be cautious in using credits as a basis for specific reduction promises. Secondly, this approach puts the focus on the reduction projects whose impact is best measurable, and not necessarily those that are best from an environmental perspective. Finally, from an environmental perspective, carbon reduction is better than a carbon offset. 'Net zero' tends to falsely equate these two efforts. This concern is amplified by the fact that research indicates that most companies (75%) do not specify any conditions which their offset choices should meet, such as conditions regarding the environmental integrity of offsets, the monitoring and reporting process associated with verifying offsets, and the social governance of offset projects ([Axelsson et al., 2022](#)).





03 Supervisory implications

3.1 Supervisory considerations

In contrast to the highly regulated mandatory carbon market, voluntary carbon markets are currently not subject to any direct government or regulatory supervision. As described in section 1 of this paper, voluntary carbon credits are issued by multiple non-governmental issuing bodies worldwide, known as standard setters, each of which has its own rules and standards.

A number of private-sector-led initiatives seek to address integrity issues in VCMs.

Voluntary carbon markets have thus far been endeavours led by private market participants. Accordingly, several private-sector-led initiatives have been created to facilitate the scaling-up of voluntary carbon markets and to increase their integrity. These initiatives, such as [TSVCM](#), the [Integrity Council for the Voluntary Carbon Market](#) and the [Voluntary Carbon Markets Integrity Initiative](#), try to address the current issues around the integrity of carbon credits, including by setting threshold standards for the quality of credits. Enhancing the standardisation of carbon credits should contribute to the commoditisation or financialisation of these assets to build credible financial instruments ([IOSCO, 2022](#)).

Market and securities regulators are starting to discuss regulatory considerations, including the legal qualification of voluntary carbon credits. [IOSCO \(2022\)](#)

has published a discussion paper that considers the role of market infrastructure and the behaviour of market participants in promoting the integrity of voluntary carbon markets. A prominent issue is the lack of legal clarity: there is no common understanding of the nature of carbon credits as traded instruments.

What regulatory framework applies and who the competent authorities are depends on the legal nature of the credits.

For example, voluntary carbon credits currently do not qualify as financial instruments under EU legislation, whereas EU Allowances (compliance carbon credits under the EU Emissions Trading System) do. In the US, carbon credits are categorised as a commodity ([ISDA, 2022](#)). The legal qualification of carbon credits determines whether financial market regulators are competent to regulate and supervise the spot market for such credits. However, derivatives on such underlyings mostly fall within the remit of financial regulators. Harmonising the definition or scope across jurisdictions will be an important enabler for scaling voluntary carbon markets at the global level ([IOSCO, 2022](#)).

Voluntary carbon credits do not qualify as financial products but there are links to regulated market participants.

As argued above, because voluntary carbon credits do not qualify as financial products under EU legislation, the AFM does not have direct supervisory powers with regard to these credits. An exception is the trade in carbon credit derivatives trade on trading venues (see section 1.4). These derivatives do qualify as financial instruments and fall within the AFM's supervisory remit. However, currently no carbon credit derivatives are traded on venues under the AFM's jurisdiction. That said, there are a number of links between VCMs and regulated markets ([IOSCO, 2022](#); [UK Voluntary Carbon Markets Forum, 2021](#)) that are of interest, as through these links, integrity concerns around VCMs could also affect the regulated markets and market participants under the AFM's supervision. Figure 8 provides an overview of how regulated market participants interact with VCMs.



Figure 8. Links between VCMs and regulated market participants



- Banks:** Banks can fulfil different roles in the supply chain of carbon credits. Banks may originate and/or fund offset projects. They can also trade in carbon credits, either on a proprietary basis or on behalf of clients. They may also use credits for their own net-zero claims. Banks are not established players in this market yet; they are relatively new to most of these roles and are in the process of developing propositions ([UK Voluntary Carbon Markets Forum, 2021](#); [World Bank, 2022](#)).
- Brokers and traders:** Brokers and traders are intermediaries buying and selling carbon credits, both on behalf of clients and on a proprietary basis. There is a lack of transparency in voluntary carbon trading, but most brokers active in the market appear to be specialist parties that are not part of the regulated financial sector ([Carbon Market Watch, 2023](#)).
- Trading venues:** Trading venues are exchanges for carbon credits. Some of the trading venues also are exchanges for regulated financial instruments that offer a separate carbon exchange platform. Exchanges for carbon credits are usually not regulated by financial regulators, but exchanges for carbon credit derivatives are (however, currently no such derivatives are traded in the markets under the AFM's supervision).

- Asset managers:** Asset managers may buy carbon credits to offset portfolio emissions as part of green or carbon-neutral investment strategies. Perhaps asset managers will in the future be able to create funds that invest in carbon credits, but currently this is not the case.
- Companies:** Companies mostly buy carbon credits as part of net-zero claims. Pursuant to legislation, including the Corporate Sustainability Reporting Directive (CSRD), companies' claims with respect to carbon credits (in the annual report or prospectus) is subject to supervision by the competent regulator. Furthermore, some larger energy firms also have their own trading desks and may invest directly in originating offset projects.
- Audit firms:** Audit firms provide assurance on reporting by listed companies, including with regard to net-zero claims and the use of carbon credits.

3.2 Our supervisory view

Given the links between unregulated VCMs and supervised financial entities, there is a case for market regulators to define a supervisory view regarding VCMs. This paper identifies three levels at which supervision could engage with VCMs (figure 9): integrity of credits (quality of credits), market integrity (fair and orderly transfer of credits) and integrity of claims backed by credits (fair and ethical use of credits and transparent communication about their use).

Figure 9. Three levels at which supervision could engage with VCMs





Efforts to increase the integrity of claims are a first priority. Net-zero claims are a main driving force behind the turbulent growth of VCMs ([ISDA, 2021](#); [World Bank, 2022](#)). To ensure market transparency, it is important that net-zero claims are proportionate to the underlying reduction efforts and/or offsetting through carbon credits. Supervisory efforts focused on the 'quality' of the demand side may induce an improvement in quality on the supply side (issuance of and trade in credits). We already have supervisory powers with regard to transparent reporting, which includes reporting on climate action targets. Therefore, this line of action would be immediately enforceable.

Initiatives aimed at increasing the integrity of credits should be supported. Increasing the integrity of credits would focus on ensuring that a carbon credit accurately represents the removal or avoidance of one tonne of carbon equivalent emitted into the atmosphere. High-quality standards can provide project developers with guidelines for developing carbon credits that are reputable and fungible. As a financial market regulator, we lack the knowledge and the mandate to prescribe what defines a high-quality carbon credit. Therefore, we support international efforts by standard setters, specific working groups and environmental agencies to increase the quality of voluntary carbon credits.

Promoting market integrity through (financial) regulation will become more important as the market matures. Promoting market integrity would focus on providing market participants with transparent rules, policies and procedures – and monitoring them – to ensure that market participants and the public are protected from manipulative and unfair conduct. Unlike issues around the quality of carbon credits, market integrity issues have strong parallels to issues prevalent in regulated financial markets, so VCMs can learn from these markets. IOSCO's discussion paper on VCMs suggests a number of regulatory tools for VCMs that have in the past helped to build well-functioning (financial) markets. These include reducing information asymmetry among market participants (i.e. making transactions and prices accessible to all market participants), creating well-developed central clearing and settlement mechanisms and resolving conflicts of interest. Given the international nature of VCMs, these efforts have to be made on an international level. This is an important solution in the long run but it will take time. We therefore support and will where possible contribute to the development of international regulatory

standards. However, given the current size and evolution of the market, setting up an elaborate regulatory framework on par with financial instruments may not be proportionate in the short term. Moreover, it might give VCMs a supervisory 'seal of approval', whereas that would only be appropriate once the market has matured and issues around the integrity of credits have been sufficiently resolved. Therefore, in the short run, focusing efforts on market integrity would appear to offer the biggest 'supervisory bang for the buck'.

Our policy approach to net-zero claims might include a set of principles regarding how voluntary carbon credits may be used within net-zero commitments. Based on our literature review and expert, we see a need to be extremely cautious in using voluntary carbon credits as a basis for net-zero claims. Given the issues around the integrity of credits, it is highly uncertain that credits will deliver on their reduction promises. Equating these carbon credits with certain and measurable emissions has conceptual flaws. These flaws should be taken into account when making net-zero claims. At a minimum, companies should be transparent about their path towards net-zero and specifically about the balance between reduction and offsetting used. Net-zero claims, especially if these are made with reference to the Paris Agreement, should account for the priorities set out in the Paris Agreement. This means that emission reduction comes before compensation. It is therefore key that in their communications, companies clearly differentiate these actions and do not create confusion about the path to net zero.

Another, more general approach might be to recognise that carbon credits and other voluntary climate action might be primarily beneficial outside of the individual net-zero framework. Carbon neutrality should be achieved on a national level rather than on an individual company level ([Broekhoff, 2021](#)). This means that companies can also contribute to the national reduction goal, without focusing on individual carbon neutrality, and make claims accordingly. This contribution to national goals is useful and necessary, even though the reduction might not be additional (because national emission reduction commitment has been pledged already) and therefore cannot be used to substantiate individual net-zero claims. Furthermore, companies may voluntarily take climate action through carbon credits or by other means, resulting in claims relating to environmental benefits other than (a specific amount of) carbon reduction.



3.3 Conclusion

Voluntary carbon credits may have environmental benefits, but their role should generally be kept outside of the net-zero framework and should be strictly defined. Carbon credits reflect a voluntary corporate contribution to fighting climate change that should be welcomed. The proceeds of carbon credits can be spent on projects with additional positive environmental impact. Most of the concerns around voluntary carbon credits relate to the wish of market participants to measure the contribution made by these credits in terms of an exact amount of carbon reduction. This is not the best way to direct funds to the most beneficial projects and may undermine actual emission reduction efforts. Nevertheless, voluntary carbon markets have their merits and should be accessible to customers who want to buy carbon credits. VCMs are an important vehicle for voluntary climate action, but this role is limited and should be strictly defined.

Clear guidance on the role of VCMs in net-zero commitments will have a positive effect on the total VCM value chain and companies' climate commitments.

Limiting the role that VCMs play in companies' net-zero commitments has the potential to mitigate the adverse market dynamics of maximising the number of credits instead of focusing on maximising quality. Establishing a more explicit distinction between emission reduction and offsets would further help to prevent confusion. Focusing on the wider contribution of VCMs, not exclusively expressed in terms of carbon emission reduction, would make it possible to select the most beneficial projects for the environment. It would also provide more clarity about net-zero claims and incentivise companies to focus on direct reductions instead of offsets.

Efforts to improve the quality of voluntary carbon credits and strengthen market integrity remain important. Our supervisory view focuses primarily on the integrity of claims, but the quality of credits and market integrity remain important topics in the international regulatory community. We support international efforts to improve standards and strengthen the market.

Expanding and strengthening compliance markets is necessary to further guide the path to net-zero. Given the need to drastically reduce emissions in a short span of time, ambiguity regarding the path of emission reduction needs to be avoided. This ambiguity is most likely best addressed as much as possible within the compliance market, underpinned by a legal framework.



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