The Challenges of the Voluntary Carbon Market: An analysis of its current state and the regulatory framework surrounding it

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***Abstract:** Interest in the Voluntary Carbon Market (VCM) increased rapidly since 2020. Recently, however, the VCM has been faced with controversy and criticism. There are indications that the total market value may have already peaked in 2022. In view of the increased public interest, intensified regulatory oversight and other challenges of the VCM, this article examines its current state, regulatory framework and challenges, as well as considerations regarding mitigations of certain deficits surrounding this market.*

1. Introduction

Globally, and particularly within Europe, companies are increasingly committed to decarbonising their operations and adapting to a lower-carbon future.[2] States and other (non-state) actors, including companies, are working towards a reduction of greenhouse gases ("**GHG**")[3] in the atmosphere. Direct reductions in emissions are preferred. Those are incentivised under various market-based instruments such as the EU allowances ("**EUAs**") granted under the *mandatory* EU Emissions Trading System ("**EU ETS**").[4] EUAs are a type of carbon allowance that allows companies within specific sectors to emit a certain amount of CO_2. Companies could also compensate for ongoing GHG emissions by making use of carbon credits traded on the *voluntary* carbon market ("**VCM**"). The VCM allows companies to offset emissions, within their own value chain, that are impracticable to reduce directly due to timing, financial or technical constraints by means of carbon credits. A voluntary carbon credit is a tradable contractual instrument (typically a certificate) that conveys a claim to avoided GHG emissions or to the enhanced removal of GHG from the atmosphere.[5] In return for allowing the buyer to compensate its own GHG emissions, carbon credits sold on the VCM steer private funds (i.e., from the purchaser of the carbon credit) to project developers of nature based projects (e.g., forest restoration) or technical solution driven projects (e.g., direct air capture). As a result, project developers are thereby provided with the necessary source of income. Companies' ambitions to meet net zero objectives as part of their transition plans have driven demand on VCMs since 2020.

Carbon offsetting by means of (voluntary) carbon credits ("**VCCs**") first occurred in the 1980s.[6] Transaction values on the VCM peaked in 2022, and fell to USD 723 million last year,[7] against a background of controversies in the VCM. These included serious allegations of greenwashing, among others fraudulent carbon credits, carbon credits whose benefits were exaggerated and unsound carbon credits.[8] Moreover, there have been reports on the ineffective-

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2. The European Green Deal, Communication from the Commission, COM (2019) 640 final; Paris Agreement to the United Nations Framework Convention on Climate Change, 12 December 2015. For further details on the EU's climate policy see EU Climate Policy (chapter 2) in: Woerdman, E., Roggenkamp, M., & Holwerda, M. (Eds.) (2021), Essential EU Climate Law (2nd ed.), Edward Elgar Publishing.
3. Greenhouse gases (GHG) are those gases that contribute to global warming, the greenhouse effect. These gases are carbon dioxide (CO2), methane (CH4), nitrous oxide (N2O), sulphur hexafluoride (SF6), nitrogen trifluoride (NF3), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs).
4. Directive (EU) 2023/959 of the European Parliament and of the Council of 10 May 2023 amending Directive 2003/87/EC establishing a system for greenhouse gas emission allowance trading within the Union and Decision (EU) 2015/1814 concerning the establishment and operation of a market stability reserve for the Union greenhouse gas emission trading system (PbEU 2023, L 130).
5. An alternative for carbon offsetting is carbon insetting. Carbon insetting relates to enhancing natural carbon sinks or applying technical solutions to remove GHGs from the atmosphere within a company's own operations and upstream and downstream value chain as opposed to an unrelated project elsewhere.
6. Heidi Blake, "The great cash-for-carbon hustle", The New Yorker, 16 October 2023.
7. Ecosystem Marketplace (EM), "State of the Voluntary Carbon Market (SOVCM)", 2024.
8. Various insights on the (potential) risks of greenwashing are explained in ISDA and Linklaters, "Navigating the Risks of Greenwashing in the Voluntary Carbon Market", April 2024; The Guardian, "Revealed: more than 90% of rainforest offsets by biggest certifier are worthless, analysis shows", 18 January 2023; "Voluntary carbon credits offset nothing more than hot air", VU Amsterdam,

ness of carbon credits delivering their intended mitigation outcomes and lack of market oversight.[9] This led to questions about the VCM's credibility and prompted further scrutiny of the market and led to calls, from the UN, the Securities and Exchange Commission and the Integrity Council for Voluntary Carbon Market ("**ICVCM**") among others, for further integrity, liquidity, transparency and certainty to bolster confidence in the VCM.[10]

Despite recent setbacks, the VCM can be used to accelerate action and raise ambition globally on climate change in line with the goals of the Paris Agreement.[11] In view of the VCM's continued promise, and taking into account the current issues surrounding it, this article examines the VCM's current state, regulatory framework, and challenges. It also considers potential other forms of VCCs, such as tokenized carbon credits ("**TCCs**"), which may address some of its deficiencies.

In Paragraph 2, we set out the current state of the carbon markets, and delve into its recent developments and challenges. Paragraph 3 will address the legal and regulatory qualification of VCCs in the Netherlands. Paragraph 4 will focus on climate transition plans and disclosure and reporting requirements impacting the VCM, including the Corporate Sustainability Reporting Directive ("**CSRD**")[12]. Paragraph 5 will set out several considerations regarding a proposed solution to mitigate its deficits: tokenized carbon credits. Finally, Paragraph 6 will offer conclusions based on the insights gathered.

2. Current State of the VCM

2.1. Overview of Carbon Markets

In short, carbon markets encompass both the regulated (compliance) market and the VCM. Both carbon markets, although serving distinct purposes, seek to contribute to the overarching goal of reducing GHG emissions. The trading volumes of the compliance market amount to almost USD 1 trillion in 2023.[13] The VCM experienced explosive growth in its early years, and whilst it is suggested that its market size could expand from USD 2 billion in 2021 to, depending on different pricing developments of VCCs, between USD 5 billion and 30 billion at the lowest end of the spectrum and up to over USD 50 billion at the highest end by 2030, it still remains the "smaller brother" market.[14]

2.1.1. Compliance market

Compliance markets are established by national, regional and/or international regulatory requirements. This is the key aspect differentiating such "mandatory" markets from the voluntary market. The most prominent and well-known example is the EU ETS, the world's first carbon market and one of its largest.[15] The EU ETS operates on the 'cap and trade' principle and covers about half of EU carbon emissions.[16] The remaining carbon emissions are from sectors not covered by the EU ETS. Since its inception in 2005, the EU ETS' objective has been to find a universal price for one (1) tonne of GHG in the atmosphere. The EU ETS provides for climate credits of European Union Allowances (EUA) for its participants, where one (1) "credit" or "allowance" represents one (1) tonne of GHG reduced in the atmosphere. By means of attaching a price to CO_2 emissi-

24 August 2023; Follow the Money, "De Rabobank belooft 'een betere wereld' met dubieuze CO2-compensatie", Follow the Money, 20 April 2024. Further information and examples of can be found in the Corporate Climate Responsibility Monitor 2022: Assessing the transparency and integrity of companies' emission reduction and net-zero targets, February 2022 available at https://carbonmarketwatch.org/wp-content/uploads/2022/02/CMW_CCRM2022_v08_FinalStretch2.pdf.

9. Further information can be found in SBTi, "Evidence Synthesis Report Part 1: Carbon Credits", July 2024. Also Kenza Bryan and Clara Murray, "Shell plant reported millions of 'phantom' carbon credits", 5 May 2024; Barbara K. Haya, Kelsey Alford-Jones, William R. L. Anderegg, Betsy Beymer-Farris, Libby Blanchard, Barbara Bomfim, Dylan Chin, Samuel Evans, Marie Hogan, Jennifer A. Holm, Kathleen McAfee, Ivy So, Thales A. P. West, Lauren With, "Berkeley Carbon Trading Project: Quality Assessment of REDD+ Carbon Credit Projects", 15 September 2023; Nina Lakhani, "Revealed: top carbon offset projects may not cut planet-heating emissions", The Guardian, 19 September 2023; Bloomberg, "Carbon Credits Found to Be Mostly 'Ineffective' in Key Study", 30 July 2024; Adreas Dijkstra, "Nomaden in Kenia compenseren CO_2 van de multinationals", Het Financieële Dagblad, 13 March 2023; A. Mandra, "The voluntary carbon market needs a dose of regulation", December 2022.
10. See ISDA and Linklaters, "Navigating the Risks of Greenwashing in the Voluntary Carbon Market", April 2024; Heidi Blake, "The great cash-for-carbon hustle", The New Yorker, 16 October 2023; Financial Times, "Solving the carbon market 'identity crisis'", 7 August 2024.
11. Paris Agreement to the United Nations Framework Convention on Climate Change, 12 December 2015, Trb. 2016, 94. The Paris Agreement entered into force on 4 November 2016.
12. Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting (PbEU 2022, L 322)
13. Reuters, "Global carbon markets value hit record $949 bln last year – LSEG", 12 February 2024; LSEG Carbon Market Year in review 2023, 12 February 2024.
14. Forest Trends' Ecosystem Marketplace, "State of the Voluntary Carbon Market 2022 Q3", 2022; AFM, Voluntary Carbon Markets – Supervisory Issues (Occasional paper), page 8; Christopher Blaufelder, Cindy Levy, Peter Mannion and Dickon Pinner, McKinsey, "A blueprint for scaling voluntary carbon markets to meet the climate challenge", 29 January 2021.
15. https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/what-eu-ets_en
16. Ibid, p. 3; Further information can be on https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets/what-eu-ets_en. Furthermore, see EU emissions trading system (chapter 3) in: Woerdman, E., Roggenkamp, M., & Holwerda, M. (Eds.) (2021). Essential EU Climate Law. (2nd ed.) Edward Elgar Publishing.

ons, the EU ETS encourages the European industry to adopt low-carbon production practices.

Compliance markets like the EU ETS require companies in specific sectors to hold sufficient allowances to cover their CO_2 emissions. Basically, this comes down to trading emission capacity, effectively granting or limiting companies the right to emit certain volumes of GHG. The sectors, the type of companies, and the nature of the GHG emissions covered under the EU ETS are strictly defined by law.[17]

2.1.2. Voluntary carbon markets

Unlike compliance markets, VCMs involve the issuance, buying and selling of carbon offsets on a voluntary basis.[18] The VCM is mostly driven by voluntary pledges to reduce GHG emissions, corporate net zero commitments and broader sustainability and biodiversity goals. A VCC's owner typically has the contractual right to claim responsibility for the reduction or removal of emissions. VCCs are recorded by different registries or registry administrators. Each registration agency, such as Verra and Gold Standard, has its own contractual framework pursuant to which the terms of the VCCs are regulated.[19] This contractual framework dictates the terms of not only sale, delivery and cancellation but also retirement of the VCC. The holder of a VCC must "retire" a VCC in order to use it and claim its associated GHG reduction towards a GHG reduction goal.[20] Once a VCC is retired, it cannot be transferred or used, meaning it is effectively taken out of circulation.

VCCs typically represent the avoidance or removal of one (1) tonne of CO_2 equivalent, achieved through certified climate mitigation projects. Those projects either target nature preservation or restoration (i.e., nature-based offsets) or technology driven (i.e. technology-based offsets). Verified by independent third parties, these credits are designed to support companies and consumers in meeting their sustainability goals.

2.2. Recent Developments and Challenges with respect to the VCM

The controversies of the VCM that were eluded on in the introductory paragraph have raised significant questions about their effectiveness. The UN, among others, has criticised the use of carbon offsets for not delivering the expected climate benefits.[21]

The main challenge seems to be on how to restore trust and transparency and boost confidence in the VCM. It has been argued that the VCM's vulnerabilities and challenge to restore confidence in the market could urge financial regulators to step in. Success of the VCM depends on environmental and financial integrity.[22] This has led to the U.S. Commodity Futures Trading Commission (CFTC) issuing a baseline standard that commodity exchanges shall comply with to list futures and other derivative products based on VCCs.[23] In the European Union, regulation *specifically* targeted at VCCs or any related products is not (yet) foreseen. However, VCCs will indirectly be covered by, *inter alia*, the CSRD. Moreover, VCCs could play a role in corporate's climate transition plans. Consequently, companies are required – insofar as such regulation applies to them – to take stock of their purchased VCCs and assess their quality together with the role they play in companies' climate mitigation objectives.

Besides further regulatory scrutiny, also the stance of the Science Based Target initiative ("**SBTi**"), an influential corporate climate action body, with regard to VCCs is likely to impact trading on the VCMs and companies' use of VCCs for their net zero ambitions. The SBTi's Corporate Net-Zero Standard is a framework for corporate net zero target setting in line with climate science, and is widely used.[24] At present, the SBTi standards require that VCCs are not counted as emission reductions toward the progress of companies' science-based targets. According to the SBTi there are clear risks to corporate use of VCCs for carbon offsetting. It concludes that the effectiveness of the use of VCCs by companies requires further research.[25] Though the SBTi is investigating

17. Further information on the EU ETS can be found on https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en; The Dutch Emissions Authority (*Nederlandse Emissieautoriteit*) is the independent national authority responsible for implementing and monitoring the EU ETS. The EU ETS has been implemented into the Dutch Environmental Management Act (*Wet milieubeheer*).
18. Commonly, the terms 'carbon offset' and 'carbon offset credit' are used interchangeably. In this article, when referring to 'carbon offset' we mean a reduction in GHG emissions or an increase in carbon storage that is used to compensate for emissions that occur elsewhere. A 'carbon offset credit' is a transferrable instrument certified by governments or independent certification bodies to represent an emission reduction of one metric tonne of CO2, or an equivalent amount of other GHGs. See also https://offsetguide.org/understanding-carbon-offsets/what-is-a-carbon-offset/.
19. For example, the Terms of Use of the Verra Registry or the Terms of Use of the Gold Standard Registry.
20. See also https://offsetguide.org/understanding-carbon-offsets/what-is-a-carbon-offset/.
21. Financial Times, "UN attacks companies' reliance on carbon credits to hit climate targets", 22 July 2024.
22. IOSCO Discussion Paper on Voluntary Carbon Markets, November 2022, page 21 and further.
23. CFTC Release Number 8829-23 dated 4 December 2023 on "CFTC Issues Proposed Guidance Regarding the Listing of Voluntary Carbon Credit Derivative Contracts" which can be found at https://www.cftc.gov/PressRoom/PressReleases/8829-23.
24. Climate Action Milestone: 6,000+ Companies Adopt Science-Based Targets, 30 August 2024 available at https://sciencebasedtargets.org/blog/climate-action-milestone-6-000-companies-adopt-science-based-targets.
25. SBTi, "Evidence Synthesis Report Part 1: Carbon Credits", July 2024, page 9 and 10.

the use of carbon offsets to tackle Scope 3[26] emissions, a final outcome is only expected in 2025.

Furthermore, to build credibility and transparency in the VCM, the Voluntary Carbon Markets initiative ("**VCMI**") issued guidance on the use of carbon offsets in order to make credible net-zero claims.[27] Also, the integrity in the supply of credits is being further investigated by the ICVCM, the world's largest coalition of private sector and environmental groups dedicated to validating carbon offsets. The ICVCM recently introduced the Core Carbon Principles ("**CCPs**") to establish a benchmark for credit quality for VCCs. The CCPs are ten (10) fundamental, science-based principles for identifying high-quality VCCs that seek to create verifiable climate impact.[28]

In addition to the transparency requirements referred to above, the European Commission and national regulators such as the Dutch Authority for Consumers and Markets (ACM) seem to be stepping up in enforcing greenwashing claims related to carbon credits.[29] The Directive on Empowering Consumers for the Green Transition prohibits the making of claims, based on the offsetting of GHG emissions through VCCs, that a product, either a good or service has a neutral, reduced, or positive impact on the environment in terms of GHG emissions.[30] In contrast, the proposed Green Claims Directive permits climate-related claims by a trader that has a neutral, reduced, or positive impact on the environment, if based on offsetting, provided that they comply with the requirements set forth in the Green Claims Directive.[31]

2.3. Growing Interconnection with the (Regulated) Financial Sector?

Another interesting development is the growing link with the (regulated) financial sector. Although VCMs are, in principle, unregulated, they are nevertheless intertwined with the regulated financial sector.[32] According to the Netherlands Authority for the Financial Markets (*Autoriteit Financiële Markten*, the "**AFM**"), the most prominent and direct regulatory link involves the trading of derivatives of VCCs[33]. There has been growing interest in this type of trading, particularly in the form of futures.[34] Noteworthy is the Global Emission Offset ("**GEO**") future launched by the Chicago Mercantile Exchange (CME) Group, the largest derivatives marketplace globally.

With growing global demand for derivative products linked to VCCs, major established derivatives exchanges increased their activities in the VCM.[35] For example, in June 2022, Nodal Exchange listed voluntary carbon offset derivatives.[36] ICE Futures Europe also launched future contracts based on VCCs.[37] On 3 June 2024, Mizuho Financial Group, Inc., one of Japan's leading global financial institutions, and London Stock Exchange Group announced an agreement to collaborate to support growth in the VCM. LSEG established a "VCM designation" for funds and companies investing in decarbonization projects expected to generate carbon credits.

Large financial institutions like Visa also seek to empower consumers to reduce their carbon footprint through certain features allowing users to calculate and offset their transactions' carbon emissions via mobile apps.[38] A card user can elect to offset individual purchases, set up monthly offsetting payments, or pair frequent transactions with an automated purchase of offsets.[39]

Although these are mere anecdotal examples, it shows the growing involvement of regulated financial institutions, such as banks, in the VCM in all sorts and forms. This also came to the attention of the AFM.[40] The main advantage of the increased participation from banks and financial institutions is that it does not only add liquidity, facilitate price discovery, and boost trading volumes in the VCM,[41] these institutions can also fulfil different roles in the supply chain of carbon credits.[42] For example, banks

26. Scope 1 emissions include direct emissions from owned or controlled sources; Scope 2 includes indirect emissions from the generation of purchased energy; Scope 3 includes all other indirect emissions that occur in the value chain including both upstream and downstream business activities.
27. The VCMI Claims Code of Practice can be found on https://vcmintegrity.org/vcmi-claims-code-of-practice/.
28. Ibid.
29. See also ACM, "Ryanair duidelijker over CO2-compensatie na actie ACM", 20 January 2023.
30. Directive (EU) 2024/825 of the European Parliament and of the Council of 28 February 2024 amending Directives 2005/29/EC and 2011/83/EU as regards empowering consumers for the green transition through better protection against unfair practices and through better information (L2024/825).
31. Proposal for a Directive of the European Parliament and of the Council on substantiation and communication of explicit environmental claims (Green Claims Directive), COM/2023/166 final. See also the recent judgment Fossielvrij/KLM in which it was established that offset claims were misleading. Further reference is made to M.J. Bosselaar, ESG litigation in de financiële sector; over class actions, climate change en greenwashing, Tijdschrift voor Financieel Recht nr. 10, October 2023.
32. AFM, Occasional Paper on Voluntary Carbon Markets (Supervisory Issues), p. 4.
33. Ibid.
34. Ibid, p. 11; Reuters: Companies turning to futures to meet carbon reduction goals.
35. AFM, Occasional Paper on Voluntary Carbon Markets (Supervisory Issues), p. 12.
36. Nodal Exchange, "Nodal Exchange Successfully Lists New Environmental Futures and Options", 17 June 2022.
37. IOSCO, "Voluntary Carbon Markets – Discussion Paper", November 2022.
38. Wall Street Journal, "Want a Carbon Offset with That?" Banks Can Help Consumers Buy Climate Action", 7 November 2023.
39. Ibid.
40. AFM, Occasional Paper on Voluntary Carbon Markets (Supervisory Issues), p. 4.
41. Wall Street Journal, "Want a Carbon Offset with That?" Banks Can Help Consumers Buy Climate Action", 7 November 2023.
42. AFM, Occasional Paper on Voluntary Carbon Markets (Supervisory Issues), p. 19.

could originate and/or fund carbon offset projects, as well as trade in VCCs, either on a proprietary basis or on behalf of clients.[43] Additionally, increased ties with the regulated financial sector could further professionalize the VCM and mitigate the aforementioned concerns of lack of oversight.

2.4. Digitization and Blockchain Technology

The digitization of VCM infrastructure, including the use of blockchain technology, is another relevant, and potentially crucial, development. In particular, tokenized carbon credits ("**TCCs**") are gaining traction.[44] TCCs are the result of transforming VCCs into digital assets within the cryptocurrency ecosystem. In more practical terms, tokenization of VCCs means that information and functionality regarding VCCs are moved onto a blockchain, where the VCC is represented as a token.

The reason behind the particular interest in tokenizing carbon credits appears to come from blockchains being well-suited for trading and retiring VCCs. These features are recognised by the UN, the World Bank[45], the World Economic Forum[46], and others.[47] TCCs are considered to offer several features that counter or mitigate the deficits of VCCs, especially in terms of their traceability, trustworthiness[48], transparency, liquidity and auditability.[49] Moreover, they offer the large benefit of making the VCM more accessible to trading for retail investors, as it allows them to not only support small-scale or niche climate projects more easily, but TCCs can also be easily split into smaller units.[50]

3. Regulatory Framework of Trading in the VCM: How do VCCs qualify?

3.1. Trading

VCCs can be acquired in the primary market, but also traded in the secondary and derivatives markets.[51] The AFM observed that most VCC trades currently occur *over-the-counter* ("**OTC**"), with only a limited number of exchanges offering VCCs.[52] While trading on exchanges generally provides more liquidity, OTC markets allow traders to customize their transactions to meet particular risk management needs.[53] The ability to trade OTC is particularly important in the early stages of a market, as it enables new products to emerge that, over time, can become standardized and move to exchanges.[54] As set out above, several regulated exchanges have launched voluntary carbon exchanges in recent years[55], seeking to bring more standardization and transparency to the VCM.

3.2. Legal Qualification

Before delving into the regulatory considerations, it is important to note that the qualification of VCCs under Dutch private law still remains somewhat uncertain. Despite the wide variety of VCCs, we deem it likely that most VCCs qualify as intangible property rights (*vermogensrechten*) under Article 3:6 of the Dutch Civil Code (*Burgerlijk Wetboek*).[56] An intangible property right is defined by two key criteria, being the fact that it serves to obtain material benefit and the transferability (*overdraagbaarheid*) of such a right.[57] If a VCC is transferable, it inherently qualifies as an intangible property right. Consequently, the trading of VCCs in the Netherlands would be governed by the general provisions of contract law and the transfer of goods.

43. Ibid.
44. State Street, "Tokenization of Carbon Credits", April 2023; FinTech Futures, "Standard Chartered pilots carbon credit tokenisation in Hong Kong with Mastercard, Mox Bank and Libeara", May 2024;. L. Swinkels, "Trading carbon credit tokens on the blockchain", November 2023; NRC Handelsblad, "Investeren in de energietransitie moet makkelijker", 2 August 2024.
45. Group, W. B., "Blockchain and Emerging Digital Technologies for Enhancing Post-2020 Climate Markets", 2018.
46. Herweijer, C., Waughray, D., Warren, S. "Building Block(chain)s for a Better Planet." World Economic Forum, 2018.
47. Sorensen, D., Tokenized Carbon Credits, 2023; Saraji, S., Borowczak, M. "Blockchain-based Carbon Credit Ecosystem."; Dorfleitner, G., Muck, F., Scheckenbach, I. "Blockchain Applications for Climate Protection: A Global Empirical Investigation." Renewable and Sustainable Energy Reviews 149 1111378 (2021); Sipthorpe, A., Brink, S., Leeuwen, T. V., Staffell, I. "Blockchain Solutions for Carbon Markets Are Nearing Maturity." One Earth 5.7 779–791(2022); Dorfleitner, G., Braun, D. "Fintech, Digitalization and Blockchain: Possible Applications for Green Finance." In M. Migliorelli, P. Dessertine (Eds.), The Rise of Green Finance in Europe Cham, Switzerland: Palgrave Macmillan 207–237 (2019); Marchant, G. E., Cooper, Z., Gough-Stone, P. J. V. "Bringing Technological Transparency to Tenebrous Markets: The Case for Using Blockchain to Validate Carbon Credit Trading Markets." Natural Resources Journal 62.2 159–182 (2022); Pan, Y., et al. "Application of Blockchain in Carbon Trading." Energy Procedia 158 4286–4291, 2019.
48. Sorensen, D, "Tokenized Carbon Credits", 2023.
49. PwC, "Carbon credit tokenisation: Pioneering a sustainable future", April 2024.
50. Ibid.
51. AFM, Occasional Paper on Voluntary Carbon Markets (Supervisory Issues), p. 11.
52. AFM, Occasional Paper on Voluntary Carbon Markets (Supervisory Issues), p. 4.
53. ISDA, "Role of Derivatives in Carbon Markets", September 2021, p. 11.
54. Ibid.
55. AFM, Occasional Paper on Voluntary Carbon Markets (Supervisory Issues), p. 12.
56. Most VCCs are in the form of a contractual right, whereby the "purchaser" or "holder" of the VCC accepts a suite of contractual terms and conditions at the time of the purchase.
57. Groene Serie Vermogensrecht, art. 3:6 Dutch Civil Code, note 5.

3.3. Regulatory Qualification

To determine whether trading VCCs on a spot or derivative basis falls under Dutch financial regulatory law, it must be assessed whether these activities involve 'financial instruments' as defined by Article 1: 1 of the Dutch Financial Supervision Act (*Wet op het financieel toezicht*, the "**FSA**").[58]

3.3.1. Spot trading

VCCs do not fall within the scope of (i) 'emission allowances consisting of any units recognised for compliance with the requirements of the EU ETS', nor (ii) any other categories of financial instruments listed in Section C of Annex I to MiFID II.[59] Accordingly, we concur with the AFM's point of view that spot trades[60] executed in VCCs are not regulated in the Netherlands.[61]

3.3.2. Derivative trading

Derivative contracts involving VCCs clearly do not qualify as financial instruments under categories C(1), (2), (3), (8), (9) or (11) of Section C, Annex I to MiFID II. Moreover, we do not consider VCCs to be commodities.[62] Therefore, derivative contracts involving VCCs are also unlikely to qualify as financial instruments under categories C(5), (6) or (7).

However, depending on the specific features of the contract, derivative contracts involving VCCs could in our view qualify as a Category C(4) financial instrument[63] and/or a Category C(10) financial instrument[64].

Regarding a Category C(4) Financial Instrument

Category C(4) of MiFID II[65] regulates derivatives relating to "emission allowances [...] which may be settled physically or in cash". The MiFID II recitals indicate that the policy intention of the EU legislature was to capture emissions allowances traded under the EU ETS. Accordingly, an argument can be made that derivatives of other underlying emissions allowances than those traded under the EU ETS (e.g., VCCs) are not to be captured under this category. However, the definition of Category C(4) of MiFID II[66] does not, contrary to the definition of Category C(11) of MiFID II[67], specify which "emission allowances" are captured under its definition. As such, we believe that derivatives of emission allowances traded outside the EU ETS are captured under Category C(4).

This view is further supported by a recent Q&A of the European Securities and Markets Authority (ESMA), confirming that the definition of derivatives on emission allowances provided in Section C(4) of Annex I to MiFID II does not distinguish between emission allowances recognised for compliance under the EU ETS Directive and other emission allowances.[68]

That being said, Category C(4) regulates derivatives relating to "emission allowances [...] which *may* be settled physically or in cash". By contrast, Category C(5) regulates derivatives relating to "[derivative contracts] that *must* be settled in cash or *may* be settled in cash at the option of one of the parties other than by reason of default or other termination event". Accordingly, we believe that there is scope to argue that VCC derivatives that *must* be physically settled or *must* be settled in cash under their terms (rather than that they *may* be settled physically or in cash) are not captured by this category of financial instruments.

Regarding a Category C(10) Financial Instrument

The first sentence of Category C(10) seeks to capture certain derivative contracts that relate to climatic variables, freight rates or inflation rates or other official economic statistics. It seems far-fetched to include VCCs under "climatic variables", let alone any of the other categories. However, the second sentence of Category C(10) serves as a broad residual category seeking to capture *any* derivative contract relating to assets, rights, obligations, indices or measures other than those already mentioned (i.e., climatic variable, freight rates, etc.), provided they have the characteristics of other derivative financial instruments, having regard to whether, *inter alia*, they are traded on a regulated market, OTF or MTF.

Derivative contracts shall be considered to have the characteristics of *other derivative financial instru-*

58. As implemented from Section C of Annex I to MiFID II.
59. Directive 2014/65/EU on markets in financial instruments.
60. Spot trading involves directly purchasing a VCC in exchange for payment. By contrast, VCC derivatives, such as futures, options or swaps, are contracts that *derive* their value from the (price) performance of a VCC.
61. AFM, Occasional Paper on Voluntary Carbon Markets (Supervisory Issues), p. 4.
62. As defined in Article 2(6) of MiFID II Delegated Regulation 2017/565 ("**DR 2017/565**").
63. Category C(4) financial instruments are "options, futures, swaps, forward rate agreements and any other derivative contracts relating to emission allowances which may be settled physically or in cash".
64. Category C(10) financial instruments are "options, futures, swaps, forward rate agreements and any other derivative contracts relating to climatic variables, freight rates or inflation rates or other official economic statistics that must be settled in cash or may be settled in cash at the option of one of the parties other than by reason of default or other termination event or any other derivative contracts (i) relating to assets, rights, obligations, indices or measures other than those mentioned above (i.e., mentioned under the definition of 'financial instrument') and (ii) which have the characteristics of other derivative financial instruments, taking into account, inter alia, whether these financial instruments are traded on an OTF, regulated market, or an MTF".
65. As implemented into Dutch law.
66. As implemented into Dutch law.
67. As implemented into Dutch law.
68. ESMA Q&A 847, 24 June 2024.

ments where one of the following conditions is satisfied[69]:

1. they are settled in cash or may be settled in cash at the option of one or more of the parties, otherwise than by reason of a default or other termination event;
2. they are traded on a regulated market, an MTF, an OTF, or a third country trading venue that performs a similar function to a regulated market, MTF or an OTF; or
3. the conditions laid down in Article 7(1) DR 2017/565 are satisfied in relation to the contracts, including that the contracts are traded on a trading venue or equivalent, and are standardized in terms of the price, the lot, the delivery date and other contractual terms.

In addition to the derivative contracts expressly referred to in Category C(10), a derivative contract is subject to the provisions in that Category if it meets the requirements in the above paragraph and relates to, *inter alia*, (a) an allowance, credit, permit, right or similar asset which is directly linked to the supply, distribution or consumption of energy derived from renewable resources, (b) a geological, environmental or other physical variable, except if the contract is relating to any units recognised for compliance with the requirements of the EU ETS Directive or (c) any other asset or right of a fungible nature, other than a right to receive a service, that is capable of being transferred.[70]

Thus, in line with the AFM's Position Paper[71], derivative contracts involving VCCs that are traded on certain types of trading venues (e.g., a regulated market, OTF or MTF) qualify as financial instruments, and, as such, are subject to regulation.

4. Disclosure and Reporting Requirements

For investors, stakeholders, and non-governmental organisations, transparency in disclosures related to net-zero targets is essential for verifying progress in decarbonisation efforts. Legislation such as the CSRD and Corporate Sustainability Due Diligence Directive ("**CSDDD**")[72] are designed to ensure that companies not only contribute to mitigating climate change but also provide transparent and reliable reports on their sustainability strategies, the outcomes of such strategies and foster sustainable and responsible corporate behaviour in companies' operations and across their global value chains.[73]

4.1. Corporate Sustainability Reporting Directive

The CSRD became effective on 5 January 2023, and introduces mandatory sustainability reporting for companies within its scope.[74] The CSRD introduces reporting requirements with the explicit aim to drive corporate behavioural change.[75] Companies within scope of the CSRD have the primary obligation to prepare a sustainability report as part of the management report.[76] These reports will ensure that key information on sustainability risks and the impact of companies on people and the environment is publicly available.[77] The CSRD outlines the contents of such sustainability report.[78]

69. Article 7(3) of DR 2017/565.
70. Article 8 of DR 2017/565.
71. AFM, Occasional Paper on Voluntary Carbon Markets (Supervisory Issues), p. 18.
72. Directive (EU) 2024/1760 of the European Parliament and of the Council of 13 June 2024 on corporate sustainability due diligence and amending Directive (EU) 2019/1937 and Regulation (EU) 2023/2859 (PbEU 2024, L 1760).
73. We refer to Directive (EU) 2022/2464 of the European Parliament and of the Council of 14 December 2022 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive 2006/43/EC and Directive 2013/34/EU, as regards corporate sustainability reporting (PbEU 2022, L 322) and Directive (EU) 2024/1760 of the European Parliament and of the Council of 13 June 2024 on corporate sustainability due diligence and amending Directive (EU) 2019/1937 and Regulation (EU) 2023/2859 (PbEU 2024, L 1760).
74. At the latest on 6 July 2024, the CSRD must be implemented into Dutch legislation. By means of the introduction of Section art. 2:391a of the Dutch Civil Code (*Burgerlijk Wetboek*) pursuant to the Implementation Act on Directive (EU) 2019/1 (Directive (EU) 2019/1 of the European Parliament and of the Council of 11 December 2018 to empower the competition authorities of the Member States to be more effective enforcers and to ensure the proper functioning of the internal market) (*Implementatiewet Richtlijn openbaarmaking winstbelasting*), a legal basis was created for the obligation for in scope companies to report in accordance with CSRD. At the date of writing of this article, Updated draft versions of the implementing legislation, being the CSRD Implementation Act (*Wet implementatie richtlijn duurzaamheidsrapportering*) and the Implementation Decree CSRD (*Implementatiebesluit richtlijn duurzaamheidsrapportering*), were published on 12 June 2024 and 28 June 2024, respectively. On 29 August 2024, the Council of State (*Raad van State*) advised to submit the revised draft CSRD Implementation Act (*Wet implementatie richtlijn duurzaamheidsrapportering*) to the Dutch Parliament for discussion and adoption. The Dutch legislator has not provided any indicative timeline around implementation.
75. See the reference to CSRD in the preamble of Directive (EU) 2024/1760 of the European Parliament and of the Council of 13 June 2024 on Corporate Sustainability Due Diligence and amending Directive (EU) 2019/1937 and Regulation (EU) 2023/2859 (CSDDD).
76. The new reporting obligations of the CSRD will be introduced gradually, with the group of companies that fall within the scope of the CSRD systematically expanding.
77. Dutch Implementation Decree CSRD (*Implementatiebesluit richtlijn duurzaamheidsrapportering*).
78. See article 19a CSRD and articles 2-5 of the Dutch Implementation Decree CSRD; In the last two years a number of articles have been published on sustainability reporting and the CSRD. These include M.J.C. van Falier en S.F.W. Vereijken-Van den Bosch, 'CSRD-readiness': het bestuursverslag van grote BV's nader onderzocht, Tijdschrift voor Jaarrekeningenrecht nr. 1, maart 2024, pages 17-31; C.M. Roozen and S.F.W. Vereijken-Van den Bosch, De CSRD: de nieuwe standaard voor duurzaamheidsrapportering, Tijdschrift voor Jaarrekeningenrecht nr. 5/6, december 2023, pages 131-142; E.V.A. Eijkelenboom, European Sustainability Reporting Standards: Een overzicht

It is widely acknowledged that good practice urges companies to have a climate road map in place.[79] The CSRD requires companies within scope of CSRD to explain in a transition plan how it will adjust its strategy and business model to ensure compatibility with the transition to a sustainable economy and limiting global warming to 1.5°C in line with the Paris Agreement.[80] Providing information about how a company uses or plans to use carbon credits to achieve the strategic ambition of its transition plan is key for having in place a robust climate transition plan. This also requires disclosing and reporting on the use of carbon credits on at least an annual basis.[81] This does not alter the fact that the Transition Plan Taskforce (TPT) good practice recommendation is that transition plans should consider Scope 1, 2, and 3 emissions[82] of a company and should prioritise decarbonisation through direct abatement over purchasing VCCs.

The good practice as eluded on in the previous paragraph is underscored by the sustainability reporting requirements under the CSRD. Sustainability reporting must comply with the European Sustainability Reporting Standards ("**ESRS**"), developed by the European Financial Reporting Advisory Group and adopted by the European Commission,[83] and which specifies the categories and the relevant information in respect of the CSRD that companies should disclose thereunder.[84] In connection with reporting on and disclosure of information on carbon credits the topical ESRS on climate change (ESRS E1-7 on GHG removals and GHG mitigation projects financed through carbon credits) as part of ESRS 1 on climate change) are most relevant.

The purpose of these particular disclosure requirements is to provide users of the sustainability reporting with details on GHG emissions and removals attributed to the company. Such information includes the extent to which the company uses carbon offsets and the source of those carbon offsets. Foremost, a company should report reliable information on carbon offsets and the efforts made by the company to effectively reduce absolute GHG emissions as part of their climate mitigation and adaptation strategies. Companies within scope of the CSRD should disclose their GHG emissions separately from carbon credits purchased, without aggregating the two.

The core of the reporting focuses on GHG emissions from Scope 1, 2, and 3.[85] This encompasses reporting on GHG removals and storage from a company's own operations and its upstream and downstream value chain. Additionally, the ESRS require disclosure on GHG emission reductions or removals from climate change mitigation projects *outside* its value chain which it has financed or intends to finance through purchasing carbon credits. The latter is a recognition that carbon credits could provide a useful means to mitigate climate change.

The ESRS counter (part of the) controversies surrounding the VCM as elaborated on in Chapter 2 by stipulating that a company must report on the quality of carbon credits that it purchased or intends to purchase. The application requirements to the topical standard on climate change explicitly state that the purchased carbon credits should fulfil high quality standards.[86] In addition, disclosures should include the type of projects (either reduction or removal projects) that the carbon credits stem from, which recognised quality standard applies, and whether carbon credits relate to projects from the EU.

4.2. Supervision by the AFM on sustainability reporting

Sustainability in general has been one of the major focus points of the AFM over the last five years.[87] Therefore, considerable attention was given and will be given to transparency on companies' sustainability goals, "sustainable" products under the Sustainable Finance Disclosure Regulation (SFDR), the risk of greenwashing and companies' net zero claims.[88] Since the adoption of the CSRD, the AFM takes a frontrunner role in ensuring compliance with the

van Europese duurzaamheidsrapportageverplichtingen, TvOB 2022-5, pages 155-159; L.K. van Dijk & J.B.S. Hijink, "Corporate Sustainability Reporting': over de Europese aanzet voor het fundament van duurzaamheidsverslaggeving', Tijdschrift voor Financieel Recht 2021, nr. 8/9, p. 276-285.

79. See www.rijksoverheid.nl/documenten/publicaties/2023/12/10/joint-statement-on-voluntary-carbon-market.
80. See AR 1 regarding Disclosure Requirement E1-1 (Transition plan for climate change mitigation) of the ESRS. The ESRS defines "transition plan" as: a specific type of action plan that is adopted by the undertaking in relation to a strategic decision and that addresses: (i.) a public policy objective; and/or (ii.) an entity-specific action plan organised as a structured set of targets and actions, associated with a key strategic decision, a major change in business model, and/or particularly important actions and allocated resources.
81. See the TPT Disclosure Framework which can be found on https://transitiontaskforce.net/disclosure-framework/.
82. See Footnote 26.
83. Commission Delegated Regulation (EU) 2023/2772 of 31 July 2023 supplementing Directive 2013/34/EU of the European Parliament and of the Council as regards sustainability reporting standards.
84. The ESRS covers three (3) categories: (i) cross cutting standards, topical standards on environmental, social and governance matters and (iii) sector specific standards. See paragraph 1.1 and further of the ESRS.
85. See Footnote 26.
86. The ESRS defines such "high quality standards" as: "quality standards for carbon credits that are verifiable by independent third parties, make requirements and project reports publicly available and at a minimum ensure additionality, permanence, avoidance of double counting and provide rules for calculation, monitoring, and verification of the project's GHG emissions and removals."
87. See AFM Agenda 2021, January 2021, page 24 and 25; AFM Agenda 2022, January 2022, page 7, 20, 29 and 30; AFM Agenda 2023, January 2023, page 5 and 6, 17; AFM Agenda 2024, January 2024, page 12.
88. See AFM Agenda 2022, January 2022, page 7, 29 and 30; AFM Agenda 2024, January 2024, page 4.

sustainability reporting rules. In the context of net zero claims by issuing entities, the VCM was signalled by the AFM as a new trend in 2023.
Companies' commitments to be climate neutral at some point in the future ('net zero claims') include offsetting of CO_2 emissions produced by the company with VCCs purchased by it.[89] According to the AFM, companies do however not provide sufficiently clear information on such offsetting claims (such as the type, source and underlying projects such credits relate to). Consequently, it remains unclear how those companies intend to achieve climate neutrality and what ratio they use between actual emissions reductions and the purchase of carbon credits.[90]

Although the AFM does not directly supervise the VCM, as set out in Chapter 2, links between VCMs and the regulated markets exist, such as the supervision of the annual reporting of listed companies. In recent years, the AFM conducted research on the readiness of companies regarding the CSRD and will continue to ensure adherence to CSRD reporting requirements. The AFM noted that listed companies have incorporated net zero targets into their transition planning[91] and recognizes the use of offset projects and carbon credits on the route towards net zero. These companies must be transparent about their net zero targets, particularly concerning the extent to which they rely on offset projects and carbon credits to meet these targets. The AFM has acknowledged the role of carbon credits in fighting climate change[92], but it also emphasizes the need for clarity in how these elements are utilized.[93]

In this context, it is interesting to note that, under Dutch law, interested parties (*belanghebbenden*) could request the Dutch Enterprise Chamber of the Court of Appeal of Amsterdam (*Ondernemingskamer van het Gerechtshof in Amsterdam*) to draw up its sustainability report in a certain manner.[94] Essentially, if the AFM would consider that net zero claims, or the use of any carbon credits by a company in its pledges for a net zero future or CO_2 reduction for that matter, lack sufficient transparency or detail, it could request the Dutch court to order to revise or rephrase the sustainability reporting included in the management report.[95] Moreover, if non-governmental organisations could successfully claim to be an interested party as well, they could order the same.[96]

We expect that the AFM's focus on sustainability and the VCM will increase, especially as the application date of the CSRD draws nearer. It remains to be seen whether the VCM and carbon credits will become so significant that civil proceedings will be frequently used to ensure transparency and accountability. Alternatively, there may be a self-regulatory capacity within the markets that could mitigate the need for civil proceedings.

5. The Regulatory Framework of a Potential Solution to Current Challenges of the VCM: Tokenized Carbon Credits

As set out above, TCCs may offer a solution to several issues VCCs face, especially in relation to traceability, credibility, auditability, liquidity and accessibility. Although there is no official (regulatory) classification of TCCs (yet), the market generally identifies two core types of TCCs, whereby TCCs either classify as carbon credit tokens or as carbon offset non-fungible tokens ("**NFTs**").[97] The main difference between these types is that carbon credit tokens are usually linked to an official VCC register in the sense that the underlying carbon credits are registered in registers like Verra or Gold Standard, whereas the carbon offset NFT is a unique token linked to one specific carbon offset object.[98]

5.1. Carbon credit tokens

Although it highly depends on the specific features of the relevant carbon credit token, we believe that such token would typically qualify as a crypto-asset

89. AFM Trendzicht 2024, November 2023, page 43.
90. Ibid.
91. AFM Supervision Report, "Transparant net zero targets require courage", 7 February 2024.
92. AFM, Occasional Paper on Voluntary Carbon Markets (Supervisory Issues), p. 21.
93. AFM Trendzicht 2024, p. 43.
94. Section 2:447 et seq. of the Dutch Civil Code. These proceedings are also known as the financial report proceedings (*jaarrekeningenprocedure*).
95. In its role as financial regulator regarding listed entities, the AFM is entitled to initiate the financial report proceedings. Otherwise, the AFM should qualify as an interested party (*belanghebbende*). Case law on any requests to revise or rephrase the management report as part of the financial report proceedings is rather limited. We refer to Hof Amsterdam (OK), 15 September 2009, ARO 2009, 148; Hof Amsterdam (OK), 19 February 2018, ARO 2018, 74 and Hof Amsterdam (OK), 23 November 2022, ARO 2022, 218. Societal pressure with regard to climate and other environmental, social and governance (ESG) matters or intensified interest by the AFM on VCCs and their role in sustainability reporting and the enforcement of CSRD could lead more use of the financial report proceedings included in Section 2:447 et seq. of the Dutch Civil Code.
96. Similarly, E.C.A. Nass, Kroniek jaarrekeningenprocedure 2020-2023, Vereniging Corporate Litigation 2023-2024 (VDHI nr. 189) 2024/I.6. Recent case law from the Dutch Enterprise Chamber of the Court of Appeal of Amsterdam suggests that the requesting party should have an 'own interest' in the financial report proceedings. Either the interested party is directly affected in its own interest by the outcome of the proceedings, such that it should be allowed to stand up for such interest, or it is so closely involved or has been involved with the relevant item being the subject matter in the financial report proceedings that it has an interest in being allowed to be heard in the request. See the conclusion of A-G Timmerman regarding HR 26 June 2020, ECLI:NL:HR:2020:1142, JOR 2020/234, m.nt. E. Nass (Eneri/GGN I) and Hof Amsterdam (OK) 6 July 2023, ECLI:NL:GHAMS:2023:1765 (Olympus I).
97. Liepe, J. and Jahn, V., Presentation on "Tokenization of Carbon Credits: Outlook on Regulatory Challenges", 30 March 2023.
98. Ibid.

within the meaning of art. 3(1)(5) MiCAR. The reason therefore is that a carbon credit token generally represents a right which allows the holder of the token to represent a claim on the reduction of a certain corresponding unit of emissions via a voluntary carbon scheme and that can be transferred and stored electronically using distributed ledger technology or similar technology.

A TCC will typically not qualify as an asset-referenced token[99] ('stable coin') as it generally does not purport to maintain a stable value by referencing a certain stock of emissions or other right, as the price of the TCC would be fully dependent on supply and demand. In our view, TCCs will in most situations qualify as a 'utility token' as defined in art. 3(1)(9) MiCAR, since they intend to provide the holder access to a service provided by the issuer of the token, i.e., the representation of a reduction, capture or otherwise off-setting of a unit of emissions.

5.2. Carbon offset NFTs

MiCAR does explicitly not apply to crypto-assets that are unique and not fungible with other-crypto-assets, including digital art and collectibles.[100] The value of such unique and non-fungible crypto-assets is attributable to each crypto-asset's unique characteristics and the utility it gives to the holder of the token.[101] The reason for their exclusion from MiCAR is that MiCAR stipulates that while unique and non-fungible crypto-assets might be traded on the marketplace and be accumulated speculatively, they are not readily interchangeable and the relative value of one such crypto-asset in relation to another, each being unique, cannot be ascertained by means of comparison to an existing market or equivalent asset. Consequently, such features limit the extent to which those crypto-assets can have a financial use, thus limiting risks to holders and the financial system and justifying their exclusion from the scope of MiCAR.[102]

While carbon offset NFTs are generally regarded as non-fungible assets, we believe that they may still be subject to regulation under MiCAR. The reason therefore is that MiCAR considers two aspects of fungibility relevant in the context of its scope. The first dimension is technical fungibility. MiCAR notes that the issuance of crypto-assets as non-fungible tokens in a large series or collection should be an indicator that they are "fungible"[103], and thus fall under the scope of MiCAR. In more practical terms: even though a crypto-asset as part of a large series or collection may have an unique identifier, the underlying technology that creates these could be the same. However, as MiCAR indicates, the mere attribution of a unique identifier to a crypto-asset is not, in and of itself, sufficient to classify it as unique and non-fungible under MiCAR.[104]

The second aspect is actual fungibility, i.e., the assets or rights represented should also be unique and non-fungible in order for the crypto-asset to be considered unique and non-fungible.[105] If the rights represented by a carbon offset NFT are interchangeable, the NFT is, in practical terms, fungible, regardless of whether it may, or may not, be technical unique.

In our view, such situation of *actual* fungibility typically arises with carbon offset NFTs (i.e., VCCs associated with a CO2 allowance), whereby each carbon offset NFT represents the right to offset one ton of CO2. Despite the potential (technical) uniqueness of each *individual* token, the underlying right (i.e., offsetting one ton of CO2) is consistent across *all* carbon offset NFTs , hence its fungibility. As the recitals of MiCAR indicate, MiCAR also applies to crypto-assets that *appear* to be unique and non-fungible, but whose *de facto* features or whose features that are linked to their *de facto* uses, would make them either fungible or not unique.[106] Consequently, depending on their individual features, carbon offset NFTs may still be subject to regulation under MiCAR.

6. Conclusions and Recommendations

The VCM is at a crucial stage. The market struggles with eroded confidence and a number of challenges, particularly regarding the credibility, quality and transparency of VCCs. Its future will therefore depend on restoring trust and confidence in the market as well as boosting its volumes and the adoption to a more mature market structure. Robust regulatory frameworks and credible verification processes will be essential to achieve this.

In the Netherlands, spot trades in VCCs remain unregulated. The qualification of derivative contracts involving VCCs as financial instrument heavily depends on their specific features. For instance, derivatives related to VVCs that (i) must be physically settled under their terms, (ii) are traded on an OTC-basis only (i.e., are not traded on a venue, expressed to be subject to the rules of a trading venue or otherwise equivalent to a contract traded on a trading venue) and (iii) are not standardised (i.e., the price, the lot, the delivery date and other terms are determined principally by reference to regularly published prices, standard lots or standard delivery dates) arguably do not qualify as a financial instrument, and are thus unregulated. However, in line with the AFM's Position Paper[107], derivative contracts involving VCCs that are traded on certain types of trading venues (e.g., a regulated market, OTF or MTF) qualify

99. Art. 3(1)(6) MiCAR.
100. Recital (10) MiCAR.
101. Ibid.
102. Ibid.
103. Recital (11) MiCAR.
104. Ibid.
105. Ibid.
106. Ibid.
107. AFM, Occasional Paper on Voluntary Carbon Markets (Supervisory Issues), p. 18.

as financial instruments, and, as such, are subject to regulation.

The various initiatives across the globe by the VCMI and the ICVCM provide examples to enhance the quality of VCCs and the necessary guidance to make credible net zero claims. Furthermore, disclosure obligations under the CSRD and the obligation to draw up climate transition plans will increase focus on the credibility and quality of VCCs as part of companies' net zero strategies. The AFM confirmed that transparency on the use of VCCs is key in understanding whether investors and other constituencies alike can validate decarbonisation in corporate value chains. For certain this means that only credible and high quality VCCs are acceptable. Intensified recognition of the role of VCCs in corporate net zero strategies – as well as any claims made in relation to them – could ultimately lead to intensified regulatory scrutiny on top of the disclosure and transparency requirements introduced recently. Overall, it is in society's best interest that emissions abatement is achieved in the most cost efficient way.

Increased quality carbon credits may not be the sole panacea. Tokenization could provide technical solutions to restore trust and transparency in the VCM. Additionally, tokenization could increase market accessibility, particularly for retail investors. The market generally identifies two core types of TCCs: carbon credit tokens and carbon offset NFTs. As both likely qualify as crypto-assets, the market of TCCs will be subject to regulation under MiCAR as from 30 December 2024. Consequently, tokenization does not only provide technical solutions for certain of the VCC's deficits, TCCs are also subject to regulatory scrutiny. Such scrutiny may not be that easy to accept but foremost it could accelerate a further professionalization of the VCM.