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ARTICLE

Can Corporations Fulfil Greenhouse Gas Emissions Reduction Responsibilities by Using Carbon Credits?

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Abstract

The corporate responsibility to reduce greenhouse gas (GHG) emissions is seen increasingly as having a legal dimension, grounded in human rights, due diligence laws, and tort law. Corporate climate strategies often rely on carbon credits to offset emissions, but available credits typically fail to deliver real reductions. This raises doubts about their suitability for meeting responsibilities to reduce emissions.

This article examines the issue through the lens of due diligence, a key concept in defining corporate obligations. Due diligence demands that firms prioritize preventive and effective action to address the climate impacts of their business activities. Available carbon credits meet neither condition; accordingly, they are, as a rule, unsuitable for fulfilling a corporate duty to reduce GHG emissions.

The article also evaluates exceptions suggested in guidance documents, particularly the use of credits for offsetting residual and Scope 3 emissions. It concludes that these exceptions are difficult to justify from a due diligence standpoint, given the limited effectiveness of credits.

Keywords: Carbon credits; Net zero; Offsetting; Climate due diligence; Corporate responsibility to reduce GHG emissions

1. Introduction

To prevent further catastrophic progression of the climate crisis, greenhouse gas (GHG) emissions must be reduced rapidly and decisively. Corporations are responsible for a large share of global GHG emissions, either by directly controlling emission sources or by producing goods and services that ultimately generate emissions.[1] In practice, therefore, the emissions reductions necessary to prevent climate breakdown will depend largely on corporations. Corporate responsibility to reduce and ultimately eliminate GHG emissions is widely acknowledged and is seen

[1] See, e.g., R. Heede, 'Tracing Anthropogenic Carbon Dioxide and Methane Emissions to Fossil Fuel and Cement Producers, 1854–2010' (2014) 122 *Climatic Change*, pp. 229–41.

increasingly as having a legal dimension.[2] Such a legal responsibility to reduce GHG emissions may arise from various sources, including human rights, mandatory due diligence laws, tort law, and soft-law instruments such as the United Nations (UN) Guiding Principles on Business and Human Rights (UNGP),[3] and the Organisation for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises on Responsible Business Conduct.[4] For instance, the Corporate Sustainability Due Diligence Directive (CSDDD),[5] recently adopted by the European Union (EU), requires large corporations to develop and implement a transition plan to address the adverse climate impacts of their business activities. However, the existence and configuration of a corporate responsibility to reduce GHG emissions remains a contentious and evolving issue, as demonstrated by the judgments in the *Milieudefensie* v. *Shell* case. The District Court of The Hague (The Netherlands) found the corporation to be under an obligation to halve its GHG emissions by 2030.[6] The Court of Appeal overturned the reduction order, but confirmed that Shell is required to reduce its emissions.[7] Illustrating the contentious and evolving character of the corporate responsibility to reduce GHG emissions, the judgments underscore the need for a deeper investigation into the subject.

An important aspect of this research concerns the use of carbon credits to offset corporate emissions. While corporations increasingly adopt strategies to mitigate the impact of their business activities on the climate, they frequently rely on carbon credits.[8] These certificates are intended to represent the reduction or removal of 1 ton of carbon dioxide (CO_2) emissions and are meant to offset the corporation's ongoing GHG emissions. They are usually generated from activities outside the corporation's value chain, such as the planting or protection of forests or the distribution of energy-efficient cooking stoves.[9] However, research shows that carbon credits typically do not achieve the promised result.[10] Given this effectiveness gap, carbon credits cannot be regarded as equivalent to genuine emissions reductions or removals and are therefore ineffective in offsetting a corporation's ongoing GHG emissions. This creates

[2] See Section 4 below.

[3] UN Human Rights Council, 'Guiding Principles on Business and Human Rights: Implementing the United Nations' "Protect, Respect and Remedy" Framework', 21 Mar. 2011, UN Doc. A/HRC/17/31 (UNGP), available at: https://www.ohchr.org/sites/default/files/documents/publications/guidingprinciplesbusinesshr_en.pdf.

[4] OECD, *OECD Guidelines for Multinational Enterprises on Responsible Business* Conduct (OECD Publishing, 2023), available at: https://mneguidelines.oecd.org/mneguidelines.

[5] Directive (EU) 2024/1760 on Corporate Sustainability Due Diligence [2024] OJ L 2024/1760 (CSDDD).

[6] *Milieudefensie* v. *Royal Dutch Shell*, 26 May 2021, ECLI:NL:RBDHA:2021:5337 (District Court of The Hague), English translation ECLI:NL:RBDHA:2021:5339, available at: https://uitspraken.rechtspraak.nl/inziendocument?id=ECLI:NL:RBDHA:2021:5339; see B. Mayer, 'The Duty of Care of Fossil-Fuel Producers for Climate Change Mitigation: *Milieudefensie* v. *Royal Dutch Shell* District Court of The Hague (The Netherlands)' (2022) 11(2) *Transnational Environmental Law*, pp. 407–18.

[7] *Milieudefensie* v. *Royal Dutch Shell (Appeal)*, 12 Nov. 2024, ECLI:NL:GHDHA:2024:2099 (Court of Appeal of The Hague), English translation ECLI:NL:GHDHA:2024:2100, available at: https://uitspraken.rechtspraak.nl/details?id=ECLI:NL:GHDHA:2024:2100.

[8] See Section 2.

[9] See Section 3.1.

[10] See Section 3.2.

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significant challenges for climate policy, as corporate climate strategies that depend on carbon credits are likely to exaggerate their actual contribution to global mitigation efforts.[11] It also raises the question of whether carbon credits can be used to fulfil the corporate responsibility to reduce GHG emissions, given the effectiveness gap.

Addressing this question is important for at least two reasons. Firstly, the regulatory framework on carbon credit use offers inadequate guidance for corporations. On the one hand, policymakers are manifestly supporting carbon credits as an instrument of climate governance regardless of the effectiveness gap. Most notably, the Paris Agreement[12] established two carbon credit mechanisms,[13] and the EU has recently adopted the Carbon Removal Certification Framework Regulation (CRCF Regulation).[14] On the other hand, court cases across the EU have determined that corporate claims that suggest that carbon credits are capable of 'neutralizing' or 'compensating' for GHG emissions are factually inaccurate and are thus misleading for consumers.[15] The recently amended Unfair Commercial Practices Directive (UCPD) explicitly prohibits 'carbon neutrality' and similar claims if they are based on carbon credit offsetting.[16] Moreover, rules on corporate sustainability disclosure hold that carbon credits should not be treated as equivalent to genuine emissions reductions.[17]

Secondly, recent years have seen a surge in soft-law standards, guidelines and recommendations aimed at regulating corporate climate strategies and carbon credit use.[18] These instruments take widely varying positions on the matter. Some entirely

[11] G. Trencher et al., 'Demand for Low-Quality Offsets by Major Companies Undermines Climate Integrity of the Voluntary Carbon Market' (2024) 15 *Nature Communications*, article 6863, p. 10.

[12] Paris (France), 12 Dec. 2015, in force 4 Nov. 2016, available at: http://unfccc.int/paris_agreement/items/9485.php.

[13] Ibid., Art. 6.

[14] Regulation (EU) 2024/3012 Establishing a Union Certification Framework for Permanent Carbon Removals, Carbon Farming and Carbon Storage in Products [2024] OJ L 2024/3012 (CRCF Regulation).

[15] *Fossielvrij* v. *KLM*, 20 Mar. 2024, ECLI:NL:RBAMS:2024:1512 (Rechtbank Amsterdam); *Deutsche Umwelthilfe* v. *Katjes*, 27 June 2024, ECLI:DE:BGH:2024:270624UIZR98.23.0 (Bundesgerichtshof); *Konsumentombudsmannen* v. *Arla Foods AB*, 2 Feb. 2023, PMT 17372-21 (Stockholms Tingsrätt).

[16] Directive 2005/29/EC concerning Unfair Business-to-Consumer Commercial Practices in the Internal Market and amending Council Directive 84/450/EEC, Directives 97/7/EC, 98/27/EC and 2002/65/EC and Regulation (EC) No. 2006/2004 [2005] OJ L 149/22 (UCPD), Annex I, para. 4a; as amended by Directive (EU) 2024/825 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 [2024] OJ L 2024/825.

[17] C. Kaupa, 'The Problem of Carbon Credits and Offsetting in Corporate Climate Disclosure' (2025) 36(4) *European Business Law Review*, pp. 573–600.

[18] E.g., Integrity Council for the Voluntary Carbon Market (ICVCM), 'Core Carbon Principles, Assessment Framework and Assessment Procedure (v.2)', Jan. 2024, available at: https://icvcm.org/wp-content/uploads/2024/02/CCP-Book-V2-FINAL-6Feb24-compressed.pdf; Science Based Targets Initiative (SBTi), 'Corporate Net-Zero Standard V1.2', Mar. 2024, available at: https://sciencebasedtargets.org/resources/files/Net-Zero-Standard.pdf; International Emissions Trading Association (IETA), 'Guidelines for High Integrity Use of Carbon Credits', Apr. 2024, available at: https://www.ieta.org/wp-content/uploads/2024/04/IETA_VCM-Guidelines.WEB-2.pdf; Voluntary Carbon Markets Integrity Initiative (VCMI), 'Claims Code of Practice (v.2)', 2023, available at: https://vcmintegrity.org/vcmi-claims-code-of-practice; International Organization for Standardization

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reject carbon credit use, while others permit a limited role, such as offsetting residual emissions.[19] Others go further, accepting carbon credit use to offset Scope 3 emissions or even Scope 1 and 2 emissions.[20] Given this contradictory regulatory landscape, it is crucial to assess whether carbon credits are an appropriate instrument for meeting corporate GHG emissions reduction responsibilities. This article examines the issue through the lens of due diligence, which has become a key concept in defining corporate responsibilities under various legal regimes.

The article is organized as follows. Section 2 addresses the role of corporations in global and EU efforts to address climate change. It discusses corporate net-zero strategies and the main concerns that have been voiced about their integrity, including carbon credit use. Section 3 reviews the relevant literature on the effectiveness of carbon credits. Section 4 discusses possible sources of a corporate responsibility to reduce GHG emissions, including human rights, mandatory due diligence laws, tort law, and soft-law standards. It highlights the role of due diligence under these regimes. Section 5 assesses carbon credit use from the perspective of due diligence. It identifies criteria to evaluate whether actions taken to fulfil corporate GHG reduction responsibilities meet the standard of due diligence, and applies these criteria to the use of carbon credits. It also assesses two cases of carbon credit use that, to different degrees, are considered acceptable by the various guidance instruments on corporate climate strategies and carbon credit use: using carbon credits to offset residual emissions or Scope 3 emissions.

The article finds that corporate due diligence obligations in addressing the climate crisis requires corporations to prioritize the prevention of GHG emissions rather than mitigating their effects. Additionally, corporations must take effective measures. This means that carbon credits, as a rule, are not a suitable method for fulfilling corporate emissions reduction responsibilities, as they neither prevent emissions within the corporate value chain nor meet the required standard of effectiveness. This is also true for residual or Scope 3 emissions. These findings suggest that corporations must proactively explore alternatives to carbon credits to address the climate-related harm of their business activities.

(ISO), 'IWA 42:2022 Net Zero Guidelines', Nov. 2022, available at: https://www.iso.org/contents/data/standard/08/50/85089.html; UN High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities, 'Integrity Matters: Net Zero Commitments by Businesses, Financial Institutions, Cities and Regions', 2022, available at: https://www.un.org/sites/un2.un.org/files/high-level_expert_group_n7b.pdf; for a systematic overview see A. McGivern et al., 'Defining Net Zero for Organisations: How Do Climate Criteria Align across Standards and Voluntary Initiatives?', Oct. 2022, available at: https://netzeroclimate.org/wp-content/uploads/2022/12/Summary-Report_Oxford-Net-Zero_October-2022.pdf.

[19] McGivern et al., ibid., pp. 26–9.

[20] See, e.g., IETA, n. 18 above, p. 9. The term 'Scope 1 emissions' describes GHG emissions from sources that are owned or controlled by the company; 'Scope 2 emissions' are GHG emissions from the production of purchased energy; 'Scope 3 emissions' are other GHG emissions that occur in the value chain, either up- or downstream; see World Resources Institute (WRI), *Greenhouse Gas Protocol: Corporate Accounting and Reporting Standard* (WRI, 2004), p. 25, available at: https://ghgprotocol.org/corporate-standard.

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2. The Role of Corporations in Addressing Climate Change

This section explores the role of corporations in addressing the climate crisis. It discusses corporate net-zero strategies and the main concerns that have been voiced about their integrity, including carbon credit use.

The Paris Agreement seeks to limit the average global temperature increase to 1.5 degrees Celsius (°C), and well below 2°C.[21] At the 28th Conference of the Parties (COP-28) to the United Nations Framework Convention on Climate Change (UNFCCC),[22] states 'resolve[d] to pursue efforts to limit the temperature increase to 1.5°C'.[23] This objective 'requires deep, rapid and sustained reductions in global greenhouse gas emissions of 43[%] by 2030 and 60[%] by 2035 relative to the 2019 level and reaching net-zero [CO_2] emissions by 2050'.[24] Corporations play a key role in this regard. According to the Intergovernmental Panel on Climate Change (IPCC), 'activities by businesses have [the] potential to significantly contribute to global mitigation efforts'.[25] The COP decision adopting the Paris Agreement 'invites' non-state actors, including the private sector, 'to scale up their efforts and support actions to reduce emissions'.[26]

The EU has set ambitious climate objectives to implement the goals of the Paris Agreement.[27] The European Climate Law prescribes net GHG emissions reductions of at least 55% by 2030, and the achievement of net-zero emissions by 2050 at the latest.[28] EU law and policy continuously highlight the role of corporations in meeting these objectives. For instance, the Commission Communication on the European Green Deal (EGD) emphasizes that major changes in corporate conduct are necessary.[29] Various legal enactments further specify the role of corporations in the transformation envisaged by the EGD, including the Taxonomy Regulation, the Sustainable Finance Disclosure Regulation, the Corporate Sustainability Reporting Directive (CSRD), and the CSDDD.[30] The latter holds in its Preamble: 'The behaviour

[21] Paris Agreement, n. 12 above, Art. 2(1)(a).

[22] New York, NY (US), 9 May 1992, in force 21 Mar. 1994, available at: https://unfccc.int.

[23] Decision 1/CMA.5, 'Outcome of the First Global Stocktake', UN Doc. FCCC/PA/CMA/2023/16/Add.1, 15 Mar. 2024, para. 4.

[24] Ibid., para. 27.

[25] F. Lecocq et al., 'Mitigation and Development Pathways in the Near to Mid-Term', in P.R. Shukla et al. (eds), *Climate Change 2022: Mitigation of Climate Change. Working Group III Contribution to the Sixth Assessment Report of the IPCC* (IPCC, 2022), pp. 409–502, at 430.

[26] Decision 1/CP.21, 'Adoption of the Paris Agreement', 29 Jan. 2016, UN Doc. FCCC/CP/2015/10/Add.1, paras 133–4; T. Hale, '"All Hands on Deck": The Paris Agreement and Nonstate Climate Action' (2016) 16(13) *Global Environmental Politics*, pp. 12–22, at 12; see also OECD Guidelines, n. 4 above, Ch. VI (Environment); UN High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities, n. 18 above, p. 19.

[27] See G. Davies, 'The European Union's Implementation of the Paris Agreement', in A. Zahar (ed.), *Research Handbook on the Law of the Paris Agreement* (Edward Elgar, 2024), pp. 323–42.

[28] Regulation (EU) 2021/1119 Establishing the Framework for Achieving Climate Neutrality [2021] OJ L 243/1, Arts. 2(1), 4(1).

[29] European Commission, 'The European Green Deal', 11 Dec. 2019, COM(2019) 640 final, pp. 4–5, 7.

[30] Regulation (EU) 2020/852 on the Establishment of a Framework to Facilitate Sustainable Investment, and amending Regulation (EU) 2019/2088 [2020] OJ L 198/13 (Taxonomy Regulation); Regulation (EU) 2019/2088 on Sustainability-related Disclosures in the Financial Services Sector [2019] OJ L 317/1; Directive (EU) 2022/2464 amending Regulation (EU) No 537/2014, Directive 2004/109/EC, Directive

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of companies across all sectors of the economy is key to success in the Union's sustainability objectives'.[31] Corporations should 'contribute to sustainable development and the sustainability transition of economies and societies'.[32] Both the Accounting Directive, as amended by the CSRD, and the CSDDD require corporations to enact a transition plan for climate change mitigation that is compatible with the international and European climate objectives.[33]

Responding to these demands, corporations increasingly adopt voluntary strategies related to the climate impact of their activities. Green and co-authors identify a corporate 'net zero wave' that gained momentum in 2018.[34] They also highlight that 'on average, Forbes500 firms adopted net-zero targets earlier and more widely than countries'.[35] Currently, 60% of the world's largest 2,000 publicly traded companies assessed by the Net Zero Tracker have set net-zero targets.[36] Illustrative examples are the carmaker Stellantis, which pledges to be 'carbon net-zero by 2038',[37] H&M's claim to 'reach a net-zero impact by 2040',[38] and Nestlé's promise to achieve 'net zero emissions by 2050 at the latest'.[39] While these headline emissions reduction targets promise ambitious contributions to global and European mitigation efforts, many aspects of the various corporate net-zero plans lack credibility.[40] Numerous areas of concern have been identified in the literature. In particular, corporate climate strategies frequently set ambiguous targets and use vague definitions.[41] They often do not cover all GHGs and frequently exclude important emission sources.[42] Many fail to set short-term reduction targets, and adopt relative instead of absolute targets. They frequently rely on renewable energy certificates to report reduced GHG emissions from purchased electricity, although these certificates are unlikely to reduce GHG emissions

2006/43/EC and Directive 2013/34/EU, as regards Corporate Sustainability Reporting [2022] OJ L 322/15 (CSRD).

31 CSDDD, n. 5 above, Preamble, Recital 4.

32 Ibid., Preamble, Recital 14.

33 Ibid., Art. 22(1); Directive 2013/34/EU on the Annual Financial Statements, Consolidated Financial Statements and Related Reports of Certain Types of Undertakings [2013] OJ L 182/19, Art. 19a(2)(iii).

34 J. Green, T. Hale & A. Arceo, 'The Net Zero Wave: Identifying Patterns in the Uptake and Robustness of National and Corporate Net Zero Targets 2015–2023' (2024) *Climate Policy*, pp. 1–14.

35 Ibid., p. 9.

36 Net Zero Tracker, 'Net Zero Stocktake 2024', 23 Sept. 2024, p. 17, available at: https://zerotracker.net/analysis/net-zero-stocktake-2024.

37 Stellantis, 'Dare Forward 2030: Care', available at: https://www.stellantis.com/en/company/dare-forward-2030/care.

38 H&M, 'Let's Clean up | Environmental Actions', available at: https://www2.hm.com/en_us/sustainability-at-hm/our-work/clean-up.html.

39 Nestlé, 'Our Net Zero Roadmap | Nestlé Global', available at: https://www.nestle.com/sustainability/climate-change/zero-environmental-impact; see also New Climate Institute and Carbon Market Watch, 'Corporate Climate Responsibility Monitor 2024', Apr. 2024, available at: https://newclimate.org/sites/default/files/2024-08/NewClimate_CCRM2024.pdf.

40 Net Zero Tracker, 'Net Zero Stocktake 2023', June 2023, p. 15, available at: https://ca1-nzt.edcdn.com/Reports/Net_Zero_Stocktake_2023.pdf?v=1696255114.

41 F. Riedel, 'Deconstructing Corporate Net-Zero and Climate Neutrality Targets in the German Chemical Industry' (2024) 24(9) *Climate Policy*, pp. 1177–94.

42 Ibid.

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in practice.[43] Almost none commit to phase out investments in carbon-intensive assets,[44] and actual commitments typically fall short of the pledged emissions reduction.[45]

Carbon credits play a key role in many corporate climate strategies. Of the 24 corporations assessed by the Corporate Climate Responsibility Monitor 2023 that have committed to implementing a 1.5°C-compliant decarbonization plan, 23 rely on carbon credits.[46] Taken together, these corporations plan to cover between 23% and 45% of their emissions through carbon credits.[47] Similarly, Trencher and co-authors show that the largest publicly traded carbon majors rely mostly on carbon credits in their net-zero strategies.[48] By contrast, their strategies do not entail concrete plans to reduce their overall supply of fossil fuels, indicating that carbon credits are largely used instead of, and not in addition to, genuine emissions reductions or removals.[49] Of the corporations assessed by the Net Zero Tracker, only a small number explicitly exclude the use of carbon credits in reaching their emissions reduction objectives.[50] Moreover, corporations typically source 'low-quality, cheap offsets'[51] and are not transparent about their use, making the assessment of the overall credibility of their net-zero strategies difficult.[52]

The widespread use of carbon credits in corporate climate strategies is viewed critically in the literature and in relevant policy instruments.[53] For example, Trencher and co-authors find that the voluntary carbon market 'is plagued by fundamental quality issues that undermine its effectiveness in reducing global emissions'.[54] The concept of carbon credit 'quality' refers to their effectiveness, which will be discussed in detail in the next section. Green and co-authors similarly identify 'myriad problems with offsets', and recommend that '[f]irms should severely limit their reliance on the voluntary [carbon] market'.[55] This view is largely shared by the various soft-law instruments and recommendations that have been enacted in the past years to regulate corporate emissions reduction strategies.[56] They typically emphasize the 'mitigation

[43] A. Bjørn et al., 'Renewable Energy Certificates Threaten the Integrity of Corporate Science-Based Targets' (2022) 12 *Nature Climate Change*, pp. 539–46.

[44] Climate Action 100+, 'Net Zero Company Benchmark 2.0 2023 Results', Oct. 2023, pp. 14–20, available at: https://www.climateaction100.org/wp-content/uploads/2023/10/2023-Key-Findings.pdf.

[45] New Climate Institute & Carbon Market Watch, 'Corporate Climate Responsibility Monitor 2023: Assessing the Transparency and Integrity of Companies' Emission Reduction and Net Zero Targets', 13 Feb. 2023, p. 5, available at: https://newclimate.org/resources/publications/corporate-climate-responsibility-monitor-2023.

[46] Ibid, p. 8.

[47] Ibid.

[48] G. Trencher, M. Blondeel & J. Asuka, 'Do All Roads Lead to Paris?' (2023) 176 *Climatic Change*, article 83.

[49] Ibid.

[50] Net Zero Tracker, 'Net Zero Tracker', available at: https://zerotracker.net.

[51] Trencher et al., n. 11 above.

[52] Net Zero Tracker, n. 36 above, p. 20.

[53] Riedel, n. 41 above; Green, Hale & Arceo, n. 34 above; Trencher et al., n. 11 above.

[54] Trencher et al., n. 11 above, p. 10.

[55] Green, Hale & Arceo, n. 34 above, p. 12.

[56] McGivern et al., n. 18 above.

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hierarchy', according to which genuine emissions reductions should be prioritized over carbon credit use.[57]

In summary, corporations are crucial for the transformation needed to achieve the objectives of the Paris Agreement. While many have adopted voluntary climate strategies and commitments, the integrity of these plans is often questionable, particularly when they rely on carbon credit use.

3. Carbon Credits and the Problem of Their Effectiveness

This section examines the concept of carbon credits and critically evaluates their effectiveness as tools for climate mitigation. While carbon credits are widely promoted as cost-effective instruments for offsetting greenhouse gas emissions, substantial uncertainties undermine their environmental integrity. The section argues that these issues create an effectiveness gap, meaning that carbon credits cannot be considered equivalent to actual emissions reductions.[58]

3.1. An Overview of Carbon Credits

Carbon credits certify a reduction in GHG emissions or their removal from the atmosphere, typically representing the reduction or removal of 1 ton of CO_2 emissions.[59] They are commonly understood to be intangible assets that can be owned and traded.[60] Carbon credits are generally acquired for the purpose of offsetting, which is the practice of accounting and reporting the GHG emissions of an entity, activity or product as lower than their actual emissions. They are consequently often referred to simply as 'carbon offsets'.[61] The practice of offsetting is based on the premise that carbon credits can 'offset' – neutralize, counterbalance or compensate for – these emissions. Carbon credits are usually recorded in the registry of a carbon credit programme. Once they have been used for offsetting, they are 'retired' and can no longer be traded.[62]

Research and policy literature provide various defences for carbon credits. They are frequently portrayed as a means to achieve mitigation goals in a cost-effective manner

[57] Ibid., pp. 26–8.

[58] This section is based on, and is partly identical to similar sections in Kaupa, n. 17 above; C. Kaupa, 'Peddling False Solutions to Worried Consumers: The Promotion of Greenhouse Gas "Offsetting" as a Misleading Commercial Practice' (2022) 11 *Journal of European Consumer and Market Law*, pp. 139–46, at 141–4; C. Kaupa, 'Scrutinizing Net Zero: The Legal Problems of Counting Greenhouse Gas Emissions, Removals and Offsets Together' (2022) 31(3) *Review of European, Comparative & International Environmental Law*, pp. 447–57, at 450–3.

[59] D. Broekhoff et al., 'Securing Climate Benefit: A Guide to Using Carbon Offsets', Stockholm Environment Institute & Greenhouse Gas Management Institute, 13 Nov. 2019, p. 6, available at: https://www.offsetguide.org/wp-content/uploads/2020/03/Carbon-Offset-Guide_3122020.pdf.

[60] J. Kaisto, 'Emission Allowances and Carbon Credits as Property: A Finnish Perspective' (2024) 12(2–3) *European Property Law Journal*, pp. 148–210; International Swaps and Derivatives Association (ISDA), 'Legal Implications of Voluntary Carbon Credits', Dec. 2021, p. 9, available at: https://www.isda.org/a/38ngE/Legal-%20Implications-of-Voluntary-Carbon-Credits.pdf.

[61] R. van Dieman et al. (eds), 'Annex: Glossary', in Shukla et al. (eds), n. 25 above, pp. 1791–820, at 1809.

[62] Broekhoff et al., n. 59 above, p. 11.

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and to support public and private decarbonization strategies.[63] In particular, carbon credits are viewed as a way to scale up nature-based and engineered removals.[64] Additionally, they are viewed as an instrument of climate finance.[65] Moreover, it is suggested that carbon credits may be necessary to address residual emissions in a number of economic sectors, including agriculture, aviation, and certain industries, which are difficult to decarbonize in both the short and medium term.[66] Carbon credits are also claimed to have environmental or social co-benefits, such as the protection of ecosystems and biodiversity.[67]

Carbon credits must be distinguished from emission allowances. The latter are issued in compliance systems such as the EU Emissions Trading System (EU ETS).[68] Emission allowances authorize polluters to emit a specific quantity of GHGs, usually 1 ton of CO_2, and can be traded. The total number of allowances is capped and corresponds to the total quantity of emissions allowed in the sectors covered by the compliance system. In contrast, carbon credits are typically created by private entities within a regulatory framework that defines minimum requirements for carbon credit generation and establishes a verification procedure.[69] These regulatory frameworks, usually termed 'carbon credit programmes' or 'standards', are created by public or private entities. Examples of the former include the Clean Development Mechanism (CDM) under the Kyoto Protocol,[70] the carbon credit mechanisms under the Paris Agreement, and the EU CRCF. Examples of the latter are Verra's Verified Carbon Standard and the Gold Standard.[71]

Carbon credits are generated from a wide range of activities, including the capture or destruction of industrial gases, renewable energy production, measures to increase energy efficiency, as well as afforestation/reforestation, forest management and forest conservation.[72] Carbon credits are typically created using a baseline-and-

[63] The White House, 'Voluntary Carbon Markets Joint Policy Statement and Principles', May 2024, available at: https://home.treasury.gov/system/files/136/VCM-Joint-Policy-Statement-and-Principles.pdf; G7 Ministers' Meeting on Climate, Energy and Environment, 'Principles of High Integrity Carbon Markets', available at: https://www.meti.go.jp/information/g7hirosima/energy/pdf/Annex004.pdf.

[64] P. Woods Ellis et al., 'The Principles of Natural Climate Solutions' (2024) 15 *Nature Communications*, article 547; P. Boyd et al., 'Carbon Offsets Aren't Helping the Planet: Four Ways To Fix Them' (2023) 620(7976) *Nature*, pp. 947–9.

[65] ICVCM, n. 18 above, p. 7.

[66] K. Axelsson et al., 'Oxford Principles for Net Zero Aligned Carbon Offsetting', Feb. 2024, p.4, available at: https://www.smithschool.ox.ac.uk/sites/default/files/2024-02/Oxford-Principles-for-Net-Zero-Aligned-Carbon-Offsetting-revised-2024.pdf.

[67] Woods Ellis et al., n. 64 above, p. 4; ICVCM, n. 18 above, pp. 40–2.

[68] Directive 2003/87/EC Establishing a Scheme for Greenhouse Gas Emission Allowance Trading within the Community and amending Council Directive 96/61/EC [2003] OJ L 275/32 (EU ETS Directive).

[69] Broekhoff et al., n. 59 above, pp. 8–9.

[70] Decision 17/CP.7, 'Modalities and Procedures for a Clean Development Mechanism as Defined in Article 12 of the Kyoto Protocol', 21 Jan. 2002, UN Doc. FCCC/CP/2001/13/Add.2; Decision 3/CMP.1, 'Modalities and Procedures for a Clean Development Mechanism as Defined in Article 12 of the Kyoto Protocol', 30 Mar. 2006, UN Doc. FCCC/KP/CMP/2005/8/Add.1.

[71] Verra, 'Verified Carbon Standard', available at: https://verra.org/programs/verified-carbon-standard; Gold Standard, 'Gold Standard', available at: https://www.goldstandard.org.

[72] UNFCCC, 'Clean Development Mechanism Methodology Booklet', 14th edn, 2022, pp. 6–11.

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credit approach.[73] A hypothetical business-as-usual scenario (the 'baseline') is modelled in which the mitigation action (such as an afforestation project) has not been undertaken. The difference between the actual emission levels and those modelled under the baseline scenario is claimed to represent the mitigation effects of the offsetting project and is issued as carbon credits. Carbon credit standards usually define environmental integrity requirements, aimed at ensuring that carbon credits genuinely achieve the claimed mitigation outcome.[74] These requirements have been developed in response to effectiveness concerns that will be discussed below, covering aspects such as double counting, leakage, appropriate baselines, additionality, and permanence.

Carbon credits and offsetting are controversial.[75] There are doubts about the effectiveness of carbon credits, with research consistently confirming these concerns.[76] Conceptualizing the acquisition of carbon credits as a legitimate alternative to actual emissions reductions is therefore viewed as problematic, particularly at a time when significant reductions are needed by both public and private actors across all sectors to meet the objectives of the Paris Agreement.

3.2. The Carbon Credit Effectiveness Gap

Carbon credits can be considered effective if the amount of CO_2 emissions reductions or removals they certify is equivalent to the actual climate impact of the projects from which they were generated.[77] However, there is broad consensus in the research and policy literature that the climate benefits of activities that generate carbon credits

[73] Ibid., p. 5.

[74] Van Dieman et al., n. 61 above, p. 1809.

[75] See, e.g., K. Anderson, 'The Inconvenient Truth of Carbon Offsets' (2012) 484 *Nature*, p. 7; Transnational Institute, *The Carbon Neutral Myth: Offset Indulgences for Your Climate Sins* (2007); E. Lövbrand, 'Bridging Political Expectations and Scientific Limitations in Climate Risk Management: On the Uncertain Effects of International Carbon Sink Policies' (2004) 67(2) *Climatic Change*, pp. 449–60; L. Lohmann, 'The Dyson Effect: Carbon "Offset" Forestry and the Privatisation of the Atmosphere' (2001) 15(1) *International Journal of Environment and Pollution*, pp. 51–78.

[76] B. Probst et al., 'Systematic Assessment of the Achieved Emission Reductions of Carbon Crediting Projects' (2024) 15 *Nature Communications*, article 9562; J. Stapp et al., 'Little Evidence of Management Change in California's Forest Offset Program' (2023) 4 *Communications Earth & Environment*, article 331; B. Haya et al., 'Comprehensive Review of Carbon Quantification by Improved Forest Management Offset Protocols' (2023) 6 *Frontiers in Forests and Global Change*; P. Greenfield, 'Revealed: More than 90% of Rainforest Carbon Offsets by Biggest Certifier Are Worthless, Analysis Shows', *The Guardian*, 18 Jan. 2023, available at: https://www.theguardian.com/environment/2023/jan/18/revealed-forest-carbon-offsets-biggest-provider-worthless-verra-aoe; S. Coffield et al., 'Using Remote Sensing to Quantify the Additional Climate Benefits of California Forest Carbon Offset Projects' (2022) 28 *Global Change Biology*, article 6789; G. Badgley et al., 'Systematic Over-Crediting in California's Forest Carbon Offsets Program' (2021) 28 *Global Change Biology*, article 1433; T. West et al., 'Overstated Carbon Emission Reductions from Voluntary REDD+ Projects in the Brazilian Amazon' (2020) 117(39) *Proceedings of the National Academy of Sciences*, pp. 24188–94.

[77] Kaupa, 'Scrutinizing Net Zero', n. 58 above, p. 450.

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cannot be equated with genuine emissions reductions or removals.[78] The fundamental reason why the climate impact of carbon credits is not equivalent to that of genuine emissions reductions is that the former is less certain than the latter.[79] The climate impact of GHG emissions is scientifically well established and uncontested.[80] By contrast, considerable uncertainty exists regarding the climate impact of carbon credits. Three main areas of uncertainty can be distinguished: (i) mitigation uncertainty, (ii) feedback uncertainty, and (iii) accounting uncertainty.[81] Therefore, currently existing carbon credits cannot be considered effective.

The *mitigation effect* of carbon offsets is uncertain for at least three reasons. Firstly, it is uncertain whether the climate benefits claimed by carbon credits correspond to actual physical effects. As discussed earlier, the climate benefits of a carbon credit-generating activity are established by comparing actual emissions with a hypothetical baseline scenario in which the activity has not taken place. Depending on the assumptions informing the baseline scenario, the amount of carbon credits generated can vary significantly.[82] This enables practices such as 'baseline manipulation' and adverse selection, with the consequence that the generated carbon credits cannot be assumed to represent real mitigation effects.[83] Secondly, uncertainty exists regarding the durability of the achieved climate benefits. The climate effects of CO_2 emissions may persist for tens or hundreds of thousands of years and are therefore quasi-permanent.[84] To effectively compensate for the harm caused by these emissions, offsetting activities also need to remain in operation permanently. However, no carbon credit-generating activity can currently be assumed to meet this requirement. For example, the climate benefits of forest-based projects, which constitute the largest share of carbon credits, are always reversible because of the risk of fire, pests,

[78] Haya et al., n. 76 above; J. Rogelj et al., 'Net-Zero Emissions Targets Are Vague: Three Ways to Fix' (2021) 591 *Nature*, pp. 365–8; W. Carton, J. Friis Lund & K. Dooley, 'Undoing Equivalence: Rethinking Carbon Accounting for Just Carbon Removal' (2021) 3 *Frontiers in Climate*, article 664130; L. Gifford, '"You Can't Value What You Can't Measure": A Critical Look at Forest Carbon Accounting' (2020) 161 *Climatic Change*, pp. 291–306; B. Haya et al., 'Managing Uncertainty in Carbon Offsets: Insights from California's Standardized Approach' (2020) 20(9) *Climate Policy*, pp. 1112–26; D. McLaren et al., 'Beyond "Net-Zero": A Case for Separate Targets for Emissions Reduction and Negative Emissions' (2019) 1 *Frontiers in Climate*, article 4; J. Dehm, 'One Tonne of Carbon Dioxide Equivalent (1tCO2e)', in J. Hohmann & J. Daniel (eds), *International Law's Objects* (Oxford University Press, 2018), pp. 305–18; J. Ajani et al., 'Comprehensive Carbon Stock and Flow Accounting: A National Framework to Support Climate Change Mitigation Policy' (2013) 89 *Ecological Economics*, pp. 61–72; Lohmann, n. 75 above.

[79] Kaupa, 'Peddling False Solutions', n. 58 above, pp. 141–4.

[80] R.P. Allan et al., 'Summary for Policymakers', in V. Masson-Delmotte et al. (eds), *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (IPCC, 2021), pp. 3–31, at 5–14.

[81] Kaupa, 'Peddling False Solutions', n. 58 above, pp. 141–2.

[82] Haya et al., n. 76 above, p. 3; R. Arendt, V. Bach & M. Finkbeiner, 'Carbon Offsets: An LCA Perspective', in S. Albrecht et al. (eds), *Progress in Life Cycle Assessment 2019* (Springer, 2021), pp. 189–207, at 195.

[83] Badgley et al., n. 76 above; West et al., n. 76 above; X. Liu & Q. Cui, 'Baseline Manipulation in Voluntary Carbon Offset Programs' (2017) 111 *Energy Policy*, pp. 9–17.

[84] D. Archer et al., 'Atmospheric Lifetime of Fossil Fuel Carbon Dioxide' (2009) 37 *Annual Review of Earth and Planetary Sciences*, pp. 117–34.

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degradation, and land-use change.[85] Thirdly, it is difficult to prove that specific carbon credit-generating activities are causally responsible for a specific quantity of emissions reductions. This is described in the research literature as the problem of 'additionality', as it must be shown that an offsetting activity has caused a mitigation effect that is additional to that which would have occurred in the absence of the project.[86]

Feedback uncertainty describes the phenomenon whereby feedback mechanisms in the earth system or in socio-economic and political systems can counteract the mitigation effects of the activities from which carbon credits are generated. Earth system feedback includes various bio-geophysical effects, such as changes in surface reflectivity caused by forestry projects.[87] The climate system can also react asymmetrically to emissions and to removals, with the magnitude of the asymmetry being uncertain and context-dependent.[88] Economic-political feedback includes market responses that cause the problems of 'leakage' and perverse incentives. Leakage describes the problem that carbon credit projects that are intended to prevent a harmful practice (such as the logging of forests or the combustion of fossil fuels) may merely displace them.[89] Carbon credit projects have also been shown to create perverse incentives for offsetting project operators to create the very situation that they are subsequently paid to prevent.[90] The benefits of offsetting projects may also be counteracted by socio-political feedback. For example, forest-based carbon credit projects have high land and water usage that compete with the resource demands of

[85] C. Allen, D. Breshears & N. McDowell, 'On Underestimation of Global Vulnerability to Tree Mortality and Forest Die-off from Hotter Drought in the Anthropocene' (2015) 6(8) *Ecosphere*, article 129; S. Fuss et al., 'Betting on Negative Emissions' (2014) 4(10) *Nature Climate Change*, pp. 850–3.

[86] Stapp et al., n. 76 above; P. Delacote, G. Le Velly & G. Simonet, 'Revisiting the Location Bias and Additionality of REDD+ Projects: The Role of Project Proponents Status and Certification' (2022) 67 *Resource and Energy Economics*, article 101277; M. Cames et al., 'How Additional Is the Clean Development Mechanism? Analysis of the Application of Current Tools and Proposed Alternatives', Mar. 2016, available at: https://climate.ec.europa.eu/system/files/2017-04/clean_dev_mechanism_en.pdf; C. Streck, 'Ensuring New Finance and Real Emission Reduction: A Critical Review of the Additionality Concept' (2011) *Carbon & Climate Law Review*, pp. 158–68; L. Schneider, 'Assessing the Additionality of CDM Projects: Practical Experiences and Lessons Learned' (2009) 9(3) *Climate Policy* 242–54; L. Schneider, 'Is the CDM Fulfilling Its Environmental and Sustainable Development Objectives? An Evaluation of the CDM and Options for Improvement', Oeko-Institut, 5 Nov. 2007, available at: http://www.monitoringmatters.org/ppdfc/cdm.pdf; S. Bode & A. Michaelowa, 'Avoiding Perverse Effects of Baseline and Investment Additionality Determination in the Case of Renewable Energy Projects' (2003) 31(6) *Energy Policy*, pp. 505–17.

[87] K. Zickfeld et al., 'Net-Zero Approaches Must Consider Earth System Impacts to Achieve Climate Goals' (2023) 13(12) *Nature Climate Change*, pp. 1298–305.

[88] Ibid., p. 1301; P.A. Arias et al., 'Technical Summary', in Masson-Delmotte et al. (eds), n. 80 above, pp. 35–144, at 64–5.

[89] C. Streck, 'REDD+ and Leakage: Debunking Myths and Promoting Integrated Solutions' (2021) 21(6) *Climate Policy*, pp. 843–52; E. Foster et al., 'The Unstudied Barriers to Widespread Renewable Energy Deployment: Fossil Fuel Price Responses' (2017) 103 *Energy Policy*, pp. 258–64; R. York, 'Do Alternative Energy Sources Displace Fossil Fuels?' (2012) 2(6) *Nature Climate Change*, pp. 441–3; K. Rosendahl and J. Strand, 'Carbon Leakage from the Clean Development Mechanism' (2011) 32(4) *The Energy Journal*, pp. 27–50.

[90] L. Schneider, 'Perverse Incentives under the CDM: An Evaluation of HFC-23 Destruction Projects' (2011) 11(2) *Climate Policy*, pp. 851–64.

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other activities, such as food production.[91] This can make carbon credit projects economically and socially unsustainable, thus undermining their long-term viability.[92] Carbon credits can also lead to 'mitigation deterrence', where the mere possibility of offsetting undermines genuine mitigation efforts.[93]

Finally, various sources of *accounting uncertainty* exist. Firstly, the offsetting process combines different sets of data that are methodologically not compatible.[94] GHG inventories are established by attributional methods, which record absolute emissions that can be ascribed based on an attributional factor.[95] By contrast, the climate impact of carbon credit projects is recorded with consequential methods, which aim to establish the relative but system-wide changes caused by a policy or a project.[96] Accounting for these changes in the GHG inventory of absolute emissions attributed to a specific entity delivers incoherent and effectively meaningless results.[97] A second source of accounting uncertainty is the problem of double counting,[98] which arises when more than one entity claims a reduction from a carbon credit-generating activity. The prevention of double counting would require an internationally uniform system of creating emissions reductions by means of carbon credit projects, accounting for them, tracking and verifying them.[99] However, such a system does not exist. Accounting uncertainty also arises from the governance structure of the voluntary carbon market.[100] Operators of carbon credit-generating projects are financially incentivized to overstate the quantity of reduced or removed emissions.[101] Verification bodies, in turn, are incentivized to verify such claims, as they are paid by the project operator and are not subject to effective public regulation and oversight. Studies show that verification bodies do not prevent the overstating of mitigation outcomes by

[91] M.R. Allen et al., 'Technical Summary', in V. Masson-Delmotte et al. (eds), *Global Warming of 1.5°C. An IPCC Special Report on the Impacts of Global Warming of 1.5°C above Pre-Industrial Levels and Related Global Greenhouse Gas Emission Pathways, in the Context of Strengthening the Global Response to the Threat of Climate Change, Sustainable Development, and Efforts to Eradicate Poverty* (IPCC, 2018), pp. 27–46, at 38.

[92] J. Rogelj et al., 'Mitigation Pathways Compatible with 1.5°C in the Context of Sustainable Development', in Masson-Delmotte et al. (eds), ibid., pp. 93–174, at 118.

[93] D. McLaren, 'Quantifying the Potential Scale of Mitigation Deterrence from Greenhouse Gas Removal Techniques' (2020) 162(4) *Climatic Change*, pp. 2411–28.

[94] WRI, *Greenhouse Gas Protocol: Corporate Accounting and Reporting Standard* (WRI, 2004), p. 82; Dehm, n. 78 above, pp. 313–7.

[95] M. Brander, 'Transposing Lessons between Different Forms of Consequential Greenhouse Gas Accounting: Lessons for Consequential Life Cycle Assessment, Project-Level Accounting, and Policy-Level Accounting' (2016) 112 *Journal of Cleaner Production*, pp. 4247–56.

[96] WRI, *GHG Protocol for Project Accounting* (WRI, 2005), pp. 21–2; Brander, n. 95 above, p. 4249.

[97] M. Brander et al., 'Carbon Accounting for Negative Emissions Technologies' (2021) 21(5) *Climate Policy*, pp. 699–717, at 701–2; Brander, n. 95 above, p. 4249.

[98] L. Schneider et al., 'Double Counting and the Paris Agreement Rulebook' (2019) 366(6462) *Science*, pp. 180–3; L. Schneider, A. Kollmuss & M. Lazarus, 'Addressing the Risk of Double Counting Emission Reductions under the UNFCCC' (2015) 131(4) *Climatic Change*, pp. 473–86.

[99] Ibid, p. 485.

[100] V. Battocletti, L. Enriques & A. Romano, 'The Voluntary Carbon Market: Market Failures and Policy Implications' (2024) 95(3) *University of Colorado Law Review*, pp. 519–73.

[101] Badgley et al., n. 76 above.

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project operators.[102] The buyer cannot ascertain whether the acquired carbon credits represent any real emissions reductions or removals because of information asymmetry and the presence of a principal–agent problem.[103] In principle, improved monitoring, better governance structures and more research can reduce some of these uncertainties; however, they are often liable to significantly increase transaction costs, making them unfeasible in practice. Moreover, regulatory remedies employed by the various carbon credit standards to address specific sources of uncertainty, such as insurance buffer pools or leakage deductions, have often been shown to be insufficient.[104] Furthermore, the possibility of future improvements does not alter the fact that the climate benefits of carbon credits are currently uncertain.

In conclusion, the climate benefits of carbon credits are more uncertain than the climate harm caused by GHG emissions. Consequently, the former cannot be assumed to be equivalent to the latter, and therefore also cannot offset it. This can be described as the effectiveness gap of carbon credits. It is interesting to note that the various guidelines and recommendations on corporate net-zero strategies and use of carbon credits increasingly recommend the use of 'high quality' or 'integrity' carbon credits.[105] However, the precise meaning of those terms typically remains undefined, which makes them liable to be misleading. In particular, they may be understood to mean that such carbon credits are fully effective, even though there is no reason to assume that the findings of the research discussed in this section would not also apply to them. It must consequently be concluded that so-called 'high quality' or 'integrity' carbon credits are also characterized by the effectiveness gap.

4. Sources of a Corporate Responsibility to Reduce Emissions and the Role of Due Diligence

This section examines potential legal sources of a corporate responsibility to reduce GHG emissions, addressing human rights, mandatory due diligence laws, tort law, and soft law standards such as the UNGP and the OECD Guidelines. The existence and precise scope of a legal responsibility for corporations to reduce their GHG emissions is a contested and evolving issue, and this section does not offer a definitive conclusion. Instead, it highlights that the concept of due diligence plays a key role in informing

[102] G. van Kooten, 'Forest Carbon Offsets and Carbon Emissions Trading: Problems of Contracting' (2017) 75 *Forest Policy and Economics*, pp. 83–8, at 85.

[103] Haya et al., n. 76 above; Van Kooten, n. 102 above, pp. 85–7; United States Government Accountability Office, 'Carbon Offsets: The U.S. Voluntary Market Is Growing, but Quality Assurance Poses Challenges for Market Participants', 29 Aug. 2008, p. 23, available at: https://www.gao.gov/products/gao-08-1048.

[104] Haya et al., n. 76 above, pp. 7–8; G. Badgley et al., 'California's Forest Carbon Offsets Buffer Pool Is Severely Undercapitalized' (2022) 5 *Frontiers in Forests and Global Change*.

[105] Axelsson et al., n. 66 above, p. 7; VCMI, n. 18 above, p. 7; ICVCM, n. 18 above, p. 7; ISO, n. 18 above, para. 10.2.

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corporate responsibilities. The concept provides a valuable analytical framework for assessing corporate carbon credit use relevant across all legal regimes that establish a corporate responsibility to reduce GHG emissions.[106]

A corporate responsibility to reduce emissions may arise from human rights. The UN Human Rights Council has established in numerous resolutions that human rights are affected by the climate crisis.[107] Ian Fry, UN Special Rapporteur on the Promotion and Protection of Human Rights in the Context of Climate Change, stated in his report to the UN General Assembly:

> Throughout the world, human rights are being negatively impacted and violated as a consequence of climate change. This includes the right to life, health, food, development, self-determination, water and sanitation, work, adequate housing and freedom from violence, sexual exploitation, trafficking and slavery.[108]

In 2022, the UN General Assembly recognized the right to a clean, healthy, and sustainable environment as a human right.[109] According to an IPCC report, this right 'arguably extends to a right to a "safe climate" shaped in part by the Paris Agreement'.[110] Human rights norms are increasingly being interpreted as obligating states to take action to prevent dangerous effects of climate change. This understanding is reinforced by a growing number of judgments, most notably the Dutch case *Urgenda*.[111] The Court found that Articles 2 and 8 of the European Convention for the Protection of Human Rights (ECHR),[112] which protect the right to life and to private and family life, require the Dutch state to reduce GHG emissions by a level that represents a fair contribution to global reduction efforts.[113] More recently, the European Court of Human Rights (ECtHR) held in *KlimaSeniorinnen* v. *Switzerland* that the failure of the Swiss government

[106] On the role of due diligence to determine corporate responsibilities under different legal regimes see, e.g., C. Mackie, 'Due Diligence in Global Value Chains: Conceptualizing "Adverse Environmental Impact"' (2021) 30(3) *Review of European, Comparative & International Environmental Law*, pp. 297–312; N. Bueno & C. Bright, 'Implementing Human Rights Due Diligence Through Corporate Civil Liability' (2020) 69(4) *International and Comparative Law Quarterly*, pp. 789–818.

[107] Office of the UN High Commissioner for Human Rights (OHCHR), 'Human Rights Council Resolutions on Human Rights and Climate Change', available at: https://www.ohchr.org/en/climate-change/human-rights-council-resolutions-human-rights-and-climate-change.

[108] OHCHR, 'Climate Change the Greatest Threat the World Has Ever Faced, UN Expert Warns', 21 Oct. 2022, available at: https://www.ohchr.org/en/press-releases/2022/10/climate-change-greatest-threat-world-has-ever-faced-un-expert-warns.

[109] UN General Assembly Resolution 76/300, 'The Human Right to a Clean, Healthy and Sustainable Environment', 28 July 2022, UN Doc. A/RES/76/300, available at: https://docs.un.org/en/A/RES/76/300.

[110] A. Patt et al., 'International Cooperation', in Shukla et al., n. 25 above, pp. 1451–545, at 1499.

[111] *The State of the Netherlands (Ministry of Infrastructure and the Environment)* v. *Stichting Urgenda*, 20 Dec. 2019, ECLI:NL:HR:2019:2006 (Supreme Court of the Netherlands), English translation ECLI:NL:HR:2019:2007, available at: https://uitspraken.rechtspraak.nl/details?id=ECLI:NL:HR:2019:2007.

[112] Convention for the Protection of Human Rights and Fundamental Freedoms, Rome (Italy), 4 Nov. 1950, in force 3 Sept. 1953, available at: http://www.echr.coe.int/pages/home.aspx?p=basictexts.

[113] *Urgenda*, n. 111 above, paras 6.1–6.6.

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to act in good time and in an appropriate manner to the threat posed by the climate crisis had violated Article 8 ECHR.[114]

Corporations must respect human rights.[115] This obligation finds expression in the UNGP,[116] which provide that corporations are required:

> [to] avoid causing or contributing to adverse human rights impacts through their own activities, and address such impacts when they occur [and to] seek to prevent or mitigate adverse human rights impacts that are directly linked to their operations, products or services by their business relationships, even if they have not contributed to those impacts'.[117]

To meet their responsibility to respect human rights, corporations should have appropriate policies and processes in place.[118] This includes a 'human rights due diligence process to identify, prevent, mitigate, and account for how they address their impacts on human rights'.[119] According to John Ruggie, former UN Special Representative for Business and Human Rights and author of the UNGP, the concept of human rights due diligence refers to 'a comprehensive, proactive attempt to uncover human rights risks, actual and potential, over the entire life cycle of a project or business activity, with the aim of avoiding and mitigating those risks'.[120] Thus, the concept has two central dimensions: (i) procedural, involving the identification of potential and actual risks from business activities; and (ii) substantive, focusing on avoiding and mitigating those risks.[121]

The responsibility to respect human rights is increasingly understood to encompass the requirement to prevent adverse climate-related impacts of corporate activities.[122] According to the UN Committee on Economic, Social and Cultural Rights, '[c]omplying with human rights in the context of climate change is a duty of both State and non-State actors'.[123] The Special Rapporteur on Human Rights and the

[114] European Court of Human Rights (ECtHR), *Verein KlimaSeniorinnen Schweiz and Others* v. *Switzerland*, Appl. No. 53600/20, 9 Apr. 2024, paras 573–4.

[115] E. Morgera, *Corporate Environmental Accountability in International Law* (Oxford University Press, 2nd edn, 2020), pp. 99–119.

[116] UNGP, n. 3 above, Principle 11.

[117] Ibid., Principle 13.

[118] Ibid., Principle 15.

[119] Ibid., Principle 15(b).

[120] UN Human Rights Council, 'Report of the Special Representative of the Secretary-General on the Issue of Human Rights and Transnational Corporations and other Business Enterprises. Business and Human Rights: Towards Operationalizing the "Protect, Respect and Remedy" Framework', 22 Apr. 2009, UN Doc. A/HRC/11/13, para. 25, available at: https://digitallibrary.un.org/record/705860?ln=en&v=pdf.

[121] J. Ruggie & J. Sherman III, 'The Concept of "Due Diligence" in the UN Guiding Principles on Business and Human Rights: A Reply to Jonathan Bonnitcha and Robert McCorquodale' (2017) 28(3) *European Journal of International Law*, pp. 921–8, at 924.

[122] R. Verheyen & J. Franke, 'Climate Change Litigation: A Reference Area for Liability', in P. Gailhofer et al. (eds), *Corporate Liability for Transboundary Environmental Harm* (Springer, 2023), pp. 353–418, at 409.

[123] UN Committee on Economic, Social and Cultural Rights, 'Climate Change and the International Covenant on Economic, Social and Cultural Rights', 31 Oct. 2018, UN Doc. E/C.12/2018/1, para. 9, available at: https://digitallibrary.un.org/record/1651395?ln=en&v=pdf.

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Environment noted that the 'main responsibilities of businesses specifically related to climate change' include the requirement 'to reduce greenhouse gas emissions from their own activities and their subsidiaries; reduce greenhouse gas emissions from their products and services; [and] minimize greenhouse gas emissions from their suppliers'.[124] Similarly, the UN Working Group on the Issue of Human Rights and Transnational Corporations and Other Business Enterprises held that the responsibilities of businesses to respect human rights under the UNGP 'include the responsibility to act in regard to actual and potential impacts related to climate change'.[125] From a procedural perspective, they should '[i]ntegrate climate change considerations in all aspects of the human rights due diligence process'.[126] In substantive terms they should 'ceas[e] any climate change-related human rights impacts that they cause or contribute to'[127] and '[p]hase out both the use of fossil fuels and the production of greenhouse gas emissions'.[128] Corporate climate-related duties under human rights norms were the subject of the Carbon Majors investigation of the Commission on Human Rights of the Philippines.[129] Relying largely on the UNGP, the Commission held that fossil fuel companies must cease exploration for fossil fuel sources to prevent further worsening of the climate crisis and related human rights impacts.[130] This demonstrates that corporations are seen increasingly as having climate-related obligations under human rights, including the responsibility to reduce their emissions. The concept of due diligence plays a central role in defining this responsibility.[131]

Over the past few years, the concept of due diligence has been incorporated into various legal acts, most notably mandatory due diligence laws.[132] The latter seek to ensure that companies act with the necessary care to prevent negative impacts of their activities, including in their value chain. This typically requires corporations to identify actual and potential adverse impacts; to prevent, end or mitigate these adverse

[124] Special Rapporteur on the Human Right to a Healthy Environment, 'Safe Climate: A Report of the Special Rapporteur on Human Rights and the Environment', 2 Oct. 2019, UN Doc. A/74/161, para. 73, available at: https://www.ohchr.org/sites/default/files/Documents/Issues/Environment/SREnvironment/Report.pdf.

[125] UN Working Group on the Issue of Human Rights and Transnational Corporations and Other Business Enterprises, 'Information Note on Climate Change and the Guiding Principles on Business and Human Rights', June 2023, para. 16, available at: https://www.ohchr.org/sites/default/files/documents/issues/business/workinggroupbusiness/Information-Note-Climate-Change-and-UNGPs.pdf.

[126] Ibid., para. 17(a).

[127] Ibid., para. 17(f).

[128] Ibid., para. 19(b).

[129] Commission on Human Rights of the Republic of the Philippines, 'National Inquiry on Climate Change Report', Dec. 2022, p. 79, available at: https://chr2bucket.storage.googleapis.com/wp-content/uploads/2022/12/08152514/CHRP_National-Inquiry-on-Climate-Change-Report.pdf.

[130] Ibid., p. 120.

[131] C. Macchi, 'The Climate Change Dimension of Business and Human Rights: The Gradual Consolidation of a Concept of "Climate Due Diligence"' (2021) 6(1) *Business and Human Rights Journal*, pp. 93–119, at 94.

[132] M. Taylor, 'Human Rights Due Diligence in Theory and Practice', in S. Deva & D. Birchall (eds), *Research Handbook on Human Rights and Business* (Edward Elgar, 2020), pp. 88–107, at 99–103; Ruggie & Sherman, n. 121 above, p. 926.

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impacts; and to implement adequate mechanisms to achieve these objectives.[133] Mandatory due diligence laws have been enacted in a number of countries, including France, Germany, and Norway.[134] In addition, the EU recently enacted the CSDDD, which lays down due diligence requirements at the EU level.[135] These mandatory due diligence frameworks vary significantly in their scope and design.[136] Some explicitly lay down a duty to prevent adverse environmental impacts. The French due diligence law is illustrative in this regard, as it requires large undertakings to establish and implement an effective vigilance plan.[137] This plan must include measures to identify and prevent severe violations of human rights and fundamental freedoms, serious bodily injury, health risks, as well as environmental damage, both within the company's own operations and across its value chain. The concept of serious environmental damage may be assumed to include the climate impact caused by GHG emissions.[138] A number of lawsuits have already addressed climate-related obligations of corporations under the French due diligence law.[139] As Rajavuori and co-authors note, these lawsuits 'point to the possibilities for including climate-related considerations in due diligence obligations, even in the absence of explicit statutory provisions to this effect'.[140]

The CSDDD was enacted in 2024 and requires large companies to 'conduct risk-based human rights and environmental due diligence'.[141] Corporations must integrate due diligence into their policies and management systems, identify and assess actual or

[133] M. Rajavuori, A. Savaresi & H. van Asselt, 'Mandatory Due Diligence Laws and Climate Change Litigation: Bridging the Corporate Climate Accountability Gap?' (2023) 17(4) *Regulation & Governance*, pp. 944–53, at 945.

[134] Code de Commerce, Art. L. 225-102-4; Lieferkettensorgfaltspflichtengesetz vom 16. Juli 2021 (BGBl. I S. 2959); Lov om virksomheters åpenhet og arbeid med grunnleggende menneskerettigheter og anstendige arbeidsforhold (åpenhetsloven), LOV-2021-06-18-99.

[135] CSDDD, n. 5 above.

[136] Rajavuori, Savaresi & Van Asselt, n. 133 above, pp. 946–7.

[137] Code de Commerce, Art. L 225-102-4, para. I.

[138] Rajavuori, Savaresi & Van Asselt, n. 133 above, p. 947.

[139] *Notre Affaire à Tous Les Amis de La Terre, and Oxfam France* v. *BNP Paribas*, available at: https://climatecasechart.com/non-us-case/notre-affaire-a-tous-les-amis-de-la-terre-and-oxfam-france-v-bnp-paribas; *Envol Vert et al.* v. *Casino*, available at: https://climatecasechart.com/non-us-case/envol-vert-et-al-v-casino; *Notre Affaire à Tous and Others* v. *Total*, available at: https://climatecasechart.com/non-us-case/notre-affaire-a-tous-and-others-v-total.

[140] Rajavuori, Savaresi & Van Asselt, n. 133 above, p. 948.

[141] CSDDD, n. 5 above, Art. 5(1); see N. Bueno et al., 'The EU Directive on Corporate Sustainability Due Diligence (CSDDD): The Final Political Compromise' (2024) 9(2) *Business and Human Rights Journal*, pp. 294–300; S. Ciacchi, 'The Newly-Adopted Corporate Sustainability Due Diligence Directive: An Overview of the Lawmaking Process and Analysis of the Final Text' (2024) 25(1) *ERA Forum*, pp. 29–48; A. Schall, 'The CSDDD: Good Law or Bad Law?' (2024) 21(3) *European Company Law*, pp. 56–8; M.-P. Weller & S. Schwemmer, 'Klimatransformationspflichten für Großunternehmen: Umsetzung des Art. 22 CSDDD via Klimaquote' (2024) 69(15) *Die Aktiengesellschaft*, pp. 517–28; H.-J. de Kluiver, 'Towards a Framework for Effective Regulatory Supervision of Sustainability Governance in Accordance with the EU CSDD Directive: A Comparative Study' (2023) 20(1) *European Company and Financial Law Review*, pp. 203–39; T. Arons & M. Lokin, 'The Corporate Climate Transition Plan: How to Ensure Companies Are Paris-Proof' (2023) 35(5) *Ondernemingsrecht*, pp. 246–56; C. Godt, 'Climate Protection and Supply Chain Civil Liability' (2023) 10(3–4) *European Journal of Comparative Law and Governance*, pp. 330–64.

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potential adverse human rights and environmental impacts, prevent and mitigate potential adverse impacts, bring actual adverse impacts to an end and minimise their extent, and monitor and assess the effectiveness of measures taken.[142] Adverse human rights and environmental impacts are defined in relation to rights, prohibitions, and obligations laid down in various international instruments listed in the Directive's Annex. Even though the Paris Agreement plays a prominent role in the CSDDD, it is not listed in its Annex. However, the Annex explicitly addresses a 'prohibition of causing any measurable environmental degradation', including 'harmful emissions', in so far as they cause harm to humans.[143] For instance, this is the case if the degradation 'substantially adversely affects ecosystem services through which an ecosystem contributes directly or indirectly to human wellbeing'.[144] This may be understood to include GHG emissions, given that corporate climate change mitigation is a core objective of the CSDDD, as highlighted in its Preamble.[145]

The CSDDD also requires corporations to enact a climate transition plan. According to its Article 22(1):

> [Companies must] adopt and put into effect a transition plan for climate change mitigation which aims to ensure, through best efforts, that the business model and strategy of the company are compatible with the transition to a sustainable economy and with the limiting of global warming to 1,5°C in line with the Paris Agreement and the objective of achieving climate neutrality as established in [the European Climate Law].

The plan must contain 'time-bound targets related to climate change for 2030 and in five-year steps up to 2050 based on conclusive scientific evidence and, where appropriate, absolute emissions reduction targets for greenhouse gas for scope 1, scope 2 and scope 3 greenhouse gas emissions for each significant category'.[146] The CSDDD is clear that the transition plan must be 'put into effect',[147] and that this must be done 'through best efforts'.[148] According to its Preamble, companies 'should strive to achieve the greenhouse gas emission reduction targets contained in their plans'.[149] The obligation, therefore, is not limited to the drawing up of a plan, but also extends to its implementation.[150] It has been interpreted as an 'obligation to act' as opposed to a mere 'obligation to report'.[151] At the same time, the Preamble clarifies that the requirements relating to the transition plan 'should be understood as an obligation of means and not of results'.[152] Furthermore, the stipulation that absolute emissions reduction targets must be included only 'where appropriate' leaves room for

[142] CSDDD, n. 5 above, Arts 5–11; Preamble, Recital 16.
[143] Ibid., Annex, Part i, para. 15.
[144] Ibid.
[145] CSDDD, n. 5 above, Preamble, Recital 73; Ciacchi, n. 141 above, p. 41.
[146] CSDDD, n. 5 above, Art. 22(1)(a).
[147] Ibid., Arts 1(1)(c), 22(1); Preamble, Recitals 50–1.
[148] Ibid., Art. 22(1).
[149] Ibid., Preamble, Recital 73.
[150] Weller & Schwemmer, n. 141 above, pp. 518–9.
[151] Ibid., p. 519.
[152] CSDDD, n. 5 above, Preamble, Recital 73.

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interpretation.[153] The Omnibus Package proposed by the European Commission in February 2025 seeks to limit corporate obligations under the CSDDD in crucial respects, for example, by eliminating the requirement to put the adopted transition plan into effect.[154]

A corporate responsibility to reduce GHG emissions may also be grounded in tort law.[155] Tort law serves two primary purposes: compensating for damage incurred and preventing future harm.[156] With this preventive aim in mind, plaintiffs have sought a change in corporate behaviour by means of court injunctions mandating the reduction of GHG emissions.[157] The case of *Milieudefensie* v. *Royal Dutch Shell* serves as a key example of this approach. Under the Dutch Civil Code, a tort is defined as a violation of a duty imposed either by law or by standards of 'proper social conduct'.[158] According to the District Court, the latter requires Shell 'to observe the due care exercised in society' in determining its corporate policy.[159] In interpreting this duty of care, the Court placed significant reliance on corporate human rights obligations and, in particular, on the UNGP.[160] Referring to the due diligence process outlined by the UNGP, it held that companies can be expected to identify and assess actual and potential human rights impacts and take appropriate action.[161] Their legal responsibility is defined by the influence and control they can exert over GHG emissions, alongside the action that is required to prevent dangerous effects of climate change.[162] Based on this, the Court ordered Shell to reduce its emissions by 45% net by 2030, relative to 2019 levels.[163] This order applied to the company's entire energy portfolio and all attributable GHG emissions (Scope 1, 2 and 3). Regarding emissions from activities that are directly controlled by Shell, this was an obligation of result.[164] For value chain emissions, it is a 'significant best-efforts obligation'.[165]

[153] Weller & Schwemmer, n. 141 above, p. 520; see also *Milieudefensie v Royal Dutch Shell* (Appeal), n. 7 above, paras 7.45–6.

[154] European Commission, 'Proposal for a Directive of the European Parliament and of the Council amending Directives 2006/43/EC, 2013/34/EU, (EU) 2022/2464 and (EU) 2024/1760 as regards Certain Corporate Sustainability Reporting and Due Diligence Requirements', 26 Feb. 2025, COM(2025) 81 final.

[155] On corporate liability in the context of the climate crisis see S. Downs, 'Civil Liability for Climate Change? The Proposed Tort in *Smith v Fonterra* with reference to France and the Netherlands' (2024) 33(1) *Review of European, Comparative & International Environmental Law*, pp. 31–44; D. Kysar, 'The Duty of Climate Care' (2024) 73 *DePaul Law Review*, pp. 487–523; Verheyen & Franke, n. 122 above; M. Hinteregger, 'Civil Liability and the Challenges of Climate Change: A Functional Analysis' (2017) 8(2) *Journal of European Tort Law*, pp. 238–59; for a critical view on the potential of tort litigation to address corporate responsibility for environmental harm see D. Bertram, 'Environmental Justice "Light"? Transnational Tort Litigation in the Corporate Anthropocene' (2022) 23(5) *German Law Journal*, pp. 738–55; see also Bueno & Bright, n. 106 above.

[156] Verheyen & Franke, n. 122 above, p. 354; Hinteregger, n. 155 above, p. 246.

[157] Verheyen & Franke, n. 122 above, p. 356.

[158] Burgerlijk Wetboek, Art. 6:162.

[159] *Milieudefensie* v. *Royal Dutch Shell*, n. 6 above, para. 4.4.1.

[160] Ibid., paras 4.4.11–21.

[161] Ibid., paras 4.4.20–1.

[162] Ibid., para. 4.4.21.

[163] Ibid., para. 4.1.4.

[164] Ibid., para. 4.4.23.

[165] Ibid., para. 4.4.24.

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The judgment was later overturned on appeal. With regard to Scope 1 and 2 emissions, the Appellate Court found that Shell had a reduction strategy in place, which implied that the duty of care was not violated.[166] With regard to Scope 3 emissions, it ruled that the specific reduction order of 45% lacked adequate support by scientific consensus.[167] Furthermore, the Court found that it could not be proven that a reduction order would be effective as Shell's trading activities, if ceased, could simply be assumed by another market participant.[168] At the same time, the Court ruled that Shell is responsible for contributing to the objectives of the Paris Agreement, including reducing its Scope 3 emissions.[169] In particular, the Court suggested that fossil fuel producers may have a responsibility to limit fossil fuel supply.

Finally, soft law standards can be a source of a corporate responsibility to reduce GHG emissions.[170] They can also influence the interpretation of corporate obligations across different legal systems. The UNGP, as the most relevant standard in this context, has already been discussed. Another significant instrument is the OECD Guidelines, which provide recommendations from states to businesses operating in or from their territory.[171] The responsibility to act with due diligence is central to the OECD Guidelines.[172] Most importantly for the purpose of this research, corporations are required to exercise due diligence in both environmental and human rights matters.[173] The 2023 update of the Guidelines specifically emphasizes climate-related responsibilities, recommending corporations to 'align with internationally agreed goals on climate change'.[174] These companies should avoid and address adverse environmental impacts, including climate change,[175] and 'contribute to reaching the goals of climate change mitigation and adaptation'.[176] They should set and implement science-based mitigation targets for the short, medium and long-term, including Scope 3 emissions.[177]

In conclusion, the preceding overview demonstrates that a corporate responsibility to reduce GHG emissions can stem from various legal sources, including human rights, mandatory due diligence laws, tort law, and soft law standards. It also highlights the importance of due diligence across all these legal frameworks, where it plays a key role in

[166] *Milieudefensie* v. *Royal Dutch Shell* (Appeal), n. 7 above, para. 7.66.
[167] Ibid., para. 7.96.
[168] Ibid., para. 7.110.
[169] Ibid., paras 7.27, 7.111.
[170] Morgera, n. 115 above, pp. 70–2, 77–8.
[171] OECD Guidelines, n. 4 above, Foreword; see Morgera, n. 115 above, pp. 120–9; on climate-related responsibilities under the OECD Guidelines see E. Aristova et al., 'Corporate Climate Change Responsibilities under the OECD Guidelines for Multinational Enterprises' (2024) 73(2) *International and Comparative Law Quarterly*, pp. 505–5; on the procedural dimension see L. Achtouk-Spivak & R. Garden, 'OECD National Contact Point Specific Instances: When "Soft Law" Bites?' (2022) 13(4) *Journal of International Dispute Settlement*, pp. 608–2.
[172] OECD Guidelines, n. 4 above, Ch. II (General Policies), A, para. 11.
[173] Ibid., paras 11–3; Ch. IV (Human Rights); Ch. VI (Environment).
[174] Ibid., Foreword, p. 3.
[175] Ibid., Ch. VI (Environment).
[176] Ibid., Commentary, para. 66.
[177] Ibid., Commentary, para. 77.

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defining corporate responsibilities, including those related to climate action.[178] Thus, due diligence offers a valuable framework for evaluating whether corporations can fulfil their responsibility to reduce their GHG emissions through the use of carbon credits.

5. Carbon Credit Use from the Perspective of Due Diligence

This section examines whether corporations can fulfil their responsibility to reduce GHG emissions by relying on carbon credits, approaching the question from the perspective of due diligence. It identifies criteria to evaluate whether actions taken to meet GHG reduction responsibilities satisfy the standards of due diligence and applies these criteria to the use of carbon credits. It finds that, as a rule, carbon credits are not an adequate means to fulfil a corporate responsibility to reduce GHG emissions. Subsequently, it discusses possible exceptions to this rule, including the use of carbon credits to offset residual emissions or Scope 3 emissions.

5.1. Carbon Credit Use and Due Diligence

As discussed in the previous section, the duty to act with due diligence requires corporations to assess and detect potential or actual harmful impacts of their business activities, to avoid these impacts, and to mitigate them once they have occurred.[179] According to Taylor, due diligence 'operationalizes a theory of responsibility which is centred on company impacts on rights and freedoms'.[180] Ruggie and Sherman note that '[d]ue diligence is how risks and impacts are identified and mitigated'.[181] This emphasis on impacts provides important guidance for evaluating whether actions taken to meet GHG reduction responsibilities align with due diligence standards. In particular, two aspects of diligent action can be highlighted.

Firstly, due diligence requires prioritizing preventive action over mitigating the adverse impact once it has occurred. The primacy of prevention is a principle of international environmental law, which also informs standards of corporate behaviour such as the OECD Guidelines.[182] According to Morgera, the principle 'expects private companies to take active steps, including the suspension of certain activities, when this is necessary to prevent otherwise certain or likely damage to internationally protected environmental resources'.[183] The OECD Due Diligence Guidance states that '[d]ue diligence is preventative', arguing that '[t]he purpose of due

[178] On the development of a corporate obligation to act with due diligence in the climate crisis under various legal frameworks see E. Colombo, 'Unpacking Corporate Due Diligence in Transnational Climate Litigation: A Planetary Perspective' (2023) *ex/ante*, pp. 35–51; Bertram, n. 155 above; C. Bright & K. Buhmann, 'Risk-Based Due Diligence, Climate Change, Human Rights and the Just Transition' (2021) 13(18) *Sustainability*, article 10454; Macchi, n. 131 above; Taylor, n. 132 above, pp. 103, 105–6.

[179] See, e.g., OECD Guidelines, n. 4 above, Ch. II (General Policies), A, paras 11–3; UNGP, n. 3 above, Principles 11, 17.

[180] Taylor, n. 132 above, p. 107.

[181] Ruggie & Sherman, n. 121 above, p. 928.

[182] Morgera, n. 115 above, p. 158.

[183] Ibid., p. 159.

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diligence is first and foremost to avoid causing or contributing to adverse impacts on people, the environment and society'.[184] The principle of preventive action is also enshrined in Article 191(2) of the Treaty on the Functioning of the EU.[185] In accordance with this principle, the CSDDD requires that 'companies take appropriate measures to prevent, or where prevention is not possible or not immediately possible, adequately mitigate potential adverse impacts'.[186] An expression of the principle of prevention is the 'waste hierarchy' outlined by the EU Waste Framework Directive, in which the prevention of waste takes priority over other ways of managing waste, including reuse, recycling and disposal.[187]

Carbon credits do not prevent corporate GHG emissions, and therefore also do not prevent the harm associated with them. According to the principle of prevention, genuine GHG emissions reductions within the corporate value chain should be prioritized over carbon credit use. This approach, known in climate policy as the 'mitigation hierarchy', is endorsed by numerous regulatory instruments and recommendations, particularly those that address corporate net-zero strategies and carbon credit use.[188] For instance, the OECD Guidelines hold:

> Enterprises should prioritise eliminating or reducing sources of emissions over offsetting, compensation, or neutralization measures. Carbon credits, or offsets may be considered as a means to address unabated emissions as a last resort. Carbon credits or offsets should be of high environmental integrity and should not draw attention away from the need to reduce emissions and should not contribute to locking-in greenhouse gas intensive processes and infrastructures.[189]

Secondly, acting with due diligence requires taking action that is effective in addressing adverse impacts. Effectiveness is a central concern of the UNGP, which provide: 'In order to verify whether adverse human rights impacts are being addressed, business enterprises should track the effectiveness of their response'.[190] Tracking should be 'based on appropriate qualitative and quantitative indicators'.[191] Similarly, the OECD Guidelines recommend the application of 'effective self-regulatory practices and management systems'.[192] The CSDDD also contains an effectiveness requirement,[193] obliging corporations to take 'appropriate measures' to prevent or mitigate adverse

[184] OECD, 'OECD Due Diligence Guidance for Responsible Business Conduct', 1 Feb. 2018, p. 16, available at: https://mneguidelines.oecd.org/due-diligence-guidance-for-responsible-business-conduct.htm.
[185] Lisbon (Portugal), 13 Dec. 2007, in force 1 Dec. 2009 [2012] OJ C 326/47.
[186] CSDDD, n. 5 above, Art. 10(1).
[187] Directive 2008/98/EC on Waste and Repealing Certain Directives [2008] OJ L 312/99, Art. 4.
[188] McGivern et al., n. 18 above, p. 27; see, e.g., SBTi, n. 18 above, p. 23; European Financial Reporting Advisory Group (EFRAG), 'ESRS E1 Climate Change Basis for Conclusions', May 2022, p. 58, available at: https://www.efrag.org/sites/default/files/sites/webpublishing/SiteAssets/BC%20E1%20Climate%20final.pdf.
[189] OECD Guidelines, n. 4 above, Ch. VI (Environment), Commentary, para. 77.
[190] UNGP, n. 3 above, Principle 20.
[191] Ibid.
[192] Ibid., Principle 19; OECD Guidelines, n. 4 above, Ch. II (General Policies), A, para. 7.
[193] Bueno et al., n. 141 above, p. 297.

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impacts.[194] These are defined as 'measures that are capable of achieving the objectives of due diligence, by effectively addressing adverse impacts'.[195] Corporations should 'monitor the adequacy and effectiveness of the identification, prevention, mitigation, bringing to an end and minimisation of the extent of adverse impacts'.[196] In evaluating the effectiveness of measures implemented, relevant scientific evidence must be taken into account: the CSDDD requires corporate climate targets to be 'based on conclusive scientific evidence';[197] the OECD Guidelines hold that '[a]dverse environmental impacts should be assessed in light of best available science',[198] and that climate action should be 'science-based'.[199]

As discussed in the previous section, research shows that currently available carbon credits typically fall short of delivering the promised mitigation outcomes, resulting in an effectiveness gap. This problem is widely acknowledged by the various instruments that regulate net-zero strategies and carbon credit use. For instance, the Oxford Principles for Net Zero Aligned Carbon Offsetting state:

> Independent evaluators from academia and civil society have found systematic and wide-reaching deficiencies in carbon markets. There remains a lack of publicly available information on the quality of carbon credits, but authoritative estimates suggest that many of them – particularly those that focus on emissions avoidance – have had poor methodologies and faulty assumptions.[200]

A recent review of the relevant research conducted by the SBTi found that 'various types of carbon credits are ineffective in delivering their intended mitigation outcomes'.[201] Additionally, the UN High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities holds that 'a system to define and ensure standards for both the integrity of the credits themselves and how non-state actors claim them is not yet in place'.[202]

From these considerations, the following conclusions emerge. Firstly, the requirement to prioritize preventive action imposes strict limitations on the use of carbon credits from the outset. Secondly, the condition that actions to mitigate adverse impacts must be effective largely disqualifies the use of currently available carbon credits because of the effectiveness gap. Consequently, as a general rule, carbon credits cannot be regarded as a suitable tool for corporations to fulfil their responsibility to reduce GHG emissions. Significantly, this understanding aligns with the perspective of the UN Working Group on the Issue of Human Rights and Transnational

[194] CSDDD, n. 5 above, Art. 10(1).
[195] Ibid., Preamble, Recital 40.
[196] Ibid., Art. 15.
[197] Ibid., Art. 22(1)(a).
[198] OECD Guidelines, n. 4 above, Ch. VI (Environment), Commentary, para. 68.
[199] Ibid., para. 77.
[200] Axelsson et al., n. 66 above, p. 14.
[201] See, e.g., SBTi, 'Evidence Synthesis Report – Part 1: Carbon Credits', July 2024, p. 9, available at: https://sciencebasedtargets.org/resources/files/Evidence-Synthesis-Report-Part-1-Carbon-Credits.pdf.
[202] UN High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities, n. 18 above, p. 19.

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Corporations and Other Business Enterprises, which is tasked with promoting the effective and comprehensive dissemination and implementation of the UNGP. In an information note on climate change and the UNGP, it states that businesses should '[p]hase out both the use of fossil fuels and the production of greenhouse gas emissions … and not use carbon offsets'.[203] Ultimately, this interpretation aligns with common sense: as currently available carbon credits fail to deliver their intended results, they cannot be relied upon to fulfil a corporation's responsibility to reduce its adverse climate impacts.

5.2. Possible Exceptions for Using Carbon Credits to Offset Residual or Scope 3 Emissions

The rule outlined above generally aligns with existing guidelines and recommendations for corporate climate strategies and carbon credit use, which typically permit the use of carbon credits only in limited, exceptional cases.[204] Notable exceptions include using carbon credits to offset residual emissions or Scope 3 emissions. However, these exceptions could still be significant in scale: corporations report a median of 10% of their total emissions as 'residual', increasing to 80% in some cases,[205] and Scope 3 emissions account for 75% of total emissions across all sectors, exceeding 90% in certain industries.[206] Therefore, these exceptions could allow corporations to offset a substantial portion of their GHG emissions. This subsection examines these exceptions from a due diligence perspective.

As previously noted, the concept of residual emissions refers to those that persist even after achieving net zero. These emissions arise from activities deemed socially necessary or desirable but are currently impossible to fully decarbonize. Many of the instruments that regulate corporate net-zero strategies do not allow carbon credit use to meet interim targets on the pathway to climate neutrality, but accept it to offset residual emissions.[207] From a perspective of due diligence, three critical observations can be made.

Firstly, the responsibility of corporations to take effective action to prevent or mitigate adverse impacts of their business activities extends to residual emissions. It is unclear why carbon credit use would be deemed acceptable for offsetting residual emissions if, because of the effectiveness gap, it is not considered appropriate for

[203] UN Working Group on the Issue of Human Rights and Transnational Corporations and Other Business Enterprises, n. 125 above, para. 19(b).

[204] McGivern et al., n. 18 above, p. 27.

[205] R. Arendt, 'Residual Carbon Emissions in Companies' Climate Pledges: Who Has to Reduce and Who Gets to Remove?' (2024) 24(9) *Climate Policy*, pp. 1195–210.

[206] CDP, 'Technical Note: Relevance of Scope 3 Categories by Sector', updated 28 June 2024, available at: https://cdn.cdp.net/cdp-production/cms/guidance_docs/pdfs/000/003/504/original/CDP-technical-note-scope-3-relevance-by-sector.pdf.

[207] UN High-Level Expert Group on the Net Zero Emissions Commitments of Non-State Entities, n. 18 above, p. 16; ISO, n. 18 above, para. 5.5; SBTi, n. 18 above, p. 20; OECD Guidelines, n. 4 above, Ch. VI (Environment), Commentary, para. 77; Commission Delegated Regulation (EU) 2023/2772 supplementing Directive 2013/34/EU as regards Sustainability Reporting Standards [2023] OJ L 2023/2772, Annex, ESRS E1, para. 60.

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offsetting non-residual emissions. Secondly, corporations have alternative methods available to address residual emissions without relying on carbon credits. An example is the model of 'climate contributions', in which corporations assign a price for their residual emissions based on the social cost of carbon, as determined by research or regulators.[208] The collected funds can be channelled to projects that are critical in the climate transition. The 'climate contributions' approach is likely to produce significantly higher funds than carbon credits given that the average price of carbon credits remains far below the social cost of carbon.[209] Thirdly, the concept of residual emissions is ambiguous and thus difficult to operationalize. While it is possible to identify activities that cannot currently be decarbonized, there is typically no objective way of determining whether they are socially necessary or otherwise desirable.[210] This is ultimately a political decision to make, for instance, in the form of sectoral emissions reduction pathways.

A second potential exception involves the use of carbon credits to offset Scope 3 emissions.[211] From a due diligence perspective, two important points can be noted. Firstly, the responsibility to exercise due diligence applies not only to impacts directly caused by a corporation but also to those to which it contributes.[212] There is no basis to assume that corporations have a diminished responsibility to prevent or mitigate adverse impacts regarding their Scope 3 emissions. Consequently, it is unclear why carbon credits, which are an ineffective tool for addressing climate-related harm, would be an appropriate means to address Scope 3 emissions. Secondly, the question of whether action to address adverse impacts in the value chain is adequate depends, among other things, on the leverage that is available to the corporation.[213] According to the UNGP commentary, '[l]everage is considered to exist where the enterprise has the ability to effect change in the wrongful practices of an entity that causes a harm'.[214] Corporations have numerous internal and external levers at their disposal to reduce

[208] New Climate Institute, 'A Guide to Climate Contributions: Taking Responsibility for Emissions without Offsetting', 7 July 2023, p. 7, available at: https://newclimate.org/resources/publications/a-guide-to-climate-contributions-taking-responsibility-for-emissions.

[209] Ibid., p. 15; Ecosystem Marketplace, 'State of the Voluntary Carbon Market 2024: On the Path to Maturity', 2024, p. 4, available at: https://www.ecosystemmarketplace.com/publications/2024-state-of-the-voluntary-carbon-markets-sovcm; K. Rennert et al., 'Comprehensive Evidence Implies a Higher Social Cost of CO_2' (2022) 610 *Nature*, pp. 687–92; R. Tol, 'Social Cost of Carbon Estimates Have Increased over Time' (2023) 13(6) *Nature Climate Change*, pp. 532–6.

[210] See A. Brad, T. Haas & E. Schneider, 'Whose Negative Emissions? Exploring Emergent Perspectives on CDR from the EU's Hard to Abate and Fossil Industries' (2024) 5 *Frontiers in Climate*, article 1268736; Arendt, n. 205 above; J. Friis Lund et al., 'Net Zero and the Unexplored Politics of Residual Emissions' (2023) 98 *Energy Research & Social Science*, article 103035.

[211] VCMI, 'Beta Scope 3 Claim: Consultation Version', 2 Sept. 2024, available at: https://vcmintegrity.org/wp-content/uploads/2024/09/VCMI-Scope-3-1.3_pages-Final.pdf; IETA, n. 18 above, p. 9; SBTi, 'Statement from the SBTi Board of Trustees on Use of Environmental Attribute Certificates, Including but Not Limited to Voluntary Carbon Markets, for Abatement Purposes Limited to Scope 3', 9 Apr. 2024, available at: https://sciencebasedtargets.org/news/statement-from-the-sbti-board-of-trustees-on-use-of-environmental-attribute-certificates-including-but-not-limited-to-voluntary-carbon-markets-for-abatement-purposes-limited-to-scope-3.

[212] UNGP, n. 3 above, Principle 17.

[213] Ibid., Principle 19(b)(ii).

[214] Ibid., Principle 19(b)(ii), Commentary.

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emissions in their value chain.[215] Internal levers include changes in business models and improvements in business processes, product design, and material efficiency. External levers include engagement with, or replacement of, suppliers and users. Exercising due diligence requires corporations to leverage their influence to achieve genuine GHG emissions reductions within their value chain. Carbon credit use does not accomplish this.

In summary, the proposed exceptions to the rule that carbon credits are not an adequate way for corporations to meet their responsibility for reducing GHG emissions are challenging to justify from a perspective of due diligence. Exercising due diligence requires corporations to actively explore and implement effective strategies to address the adverse climate impacts of their operations, including their residual and Scope 3 emissions, which excludes the use of currently available carbon credits.

6. Conclusion

Carbon credits are a problematic tool of climate governance. On the one hand, they are presented as a solution for many challenges in the climate transition, especially with regard to incentivizing corporate engagement. Carbon credits are intended to provide a cost-effective means of mitigating climate change, scaling up carbon dioxide removal technologies, facilitating climate finance, and enabling corporations to achieve emissions reductions in alignment with the goals of the Paris Agreement. On the other hand, research shows that existing carbon credits are typically characterized by an effectiveness gap. This contradiction is also mirrored in the regulatory framework governing carbon credits. Policymakers have established frameworks to regulate the creation of carbon credits, effectively endorsing their use. At the same time, carbon credit use for offsetting purposes raises legal issues, most notably under unfair commercial practices law. Many of the guidelines and recommendations on corporate net-zero strategies and carbon credit use are similarly contradictory. They acknowledge the non-equivalence between carbon credits and genuine emissions reductions but still accept their use to varying degrees.

Corporations are increasingly held responsible, including legally, for contributing to global mitigation efforts by reducing their GHG emissions. This article assessed whether corporations may rely on carbon credits to fulfil this responsibility. As a corporate obligation to reduce GHG emissions may arise under various legal regimes – such as human rights law, mandatory due diligence law, tort law, and soft law instruments – this research approached the issue from the perspective of due diligence, which applies across all of these frameworks. The article found that the

[215] World Economic Forum, 'The "No-Excuse" Framework to Accelerate the Path to Net-Zero Manufacturing and Value Chains', 5 Jan. 2023, available at: https://www.weforum.org/publications/the-no-excuse-framework-to-accelerate-the-path-to-net-zero-manufacturing-and-value-chains; SBTi, 'Best Practices in Scope 3 Greenhouse Gas Management', 5 Nov. 2018, available at: https://sciencebasedtargets.org/resources/files/SBT_Value_Chain_Report-1.pdf.

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responsibility to act with due diligence requires corporations to prioritize preventive and effective action to address the climate impacts of their business activities. As a general rule, this excludes carbon credit use, as it is neither preventive nor effective. Consequently, corporations must explore alternative ways of addressing the adverse climate impacts of their activities, including their residual and Scope 3 emissions. While undoubtedly challenging, this approach is preferable to relying on carbon credits.

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