The role of the voluntary carbon market in achieving national climate targets in Europe: A case for systems thinking

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Abstract

To achieve its climate objectives, the European Union (EU) has developed a complex legal framework which includes binding national targets for greenhouse gas (GHG) reductions and removals for each Member State. At the same time, many companies are adopting voluntary climate targets, often relying on carbon offsets purchased through the voluntary carbon market (VCM) to meet them. Recent trends indicate a growing convergence between national and corporate climate target frameworks. This article discusses one such example, where EU Member States leverage the VCM to support domestic climate projects as part of their strategies to meet national climate targets. The article analyses the implications of this by examining the interaction between national and corporate climate target frameworks in Europe. Using systems thinking as a conceptual lens, it views these frameworks as distinct yet interconnected subsystems within the broader system of global climate objectives. The analysis compares key elements of each framework and addresses potential 'systemic challenges' that arise from their interaction, particularly the risks of double claiming and non-additionality. The article argues that without proper regulatory reforms, reliance on the VCM to advance national climate targets could undermine broader climate objectives, including those of the Paris Agreement. Given the complexity of these two target-based frameworks and their interaction, the article advocates for the use of systems thinking in regulating the VCM in Europe.

Keywords: National climate targets, corporate net-zero targets, EU climate law, voluntary carbon market, double claiming, additionality, systems thinking

1. Introduction

The European Union (EU) has developed a complex framework of legal rules, mechanisms, and institutions aimed at achieving its climate objectives.[1] A key component of this framework is a set of binding national targets for greenhouse gas (GHG) reductions and removals assigned to each Member State under the Effort Sharing[2] and LULUCF Regulations.[3] Concurrently, a

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[1] For a general overview of EU's climate law and policy, see Edwin Woerdman et al. (eds), *Essential EU Climate Law* (2nd edn, Edward Elgar Publishing 2021) 10–97.

[2] Regulation (EU) 2018/842 of the European Parliament and of the Council of 30 May 2018 on binding annual greenhouse gas emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No 525/2013 [2018] OJ L156/26 (Effort Sharing Regulation).

[3] Regulation (EU) 2018/841 of the European Parliament and of the Council of 30 May 2018 on the inclusion of greenhouse gas emissions and removals from land use,

parallel framework of voluntary climate targets has emerged in Europe, reflecting a global trend where companies independently commit to climate goals, often using offsets from the voluntary carbon market (VCM)[4] to meet them.[5]

These frameworks, though operating in separate domains of climate governance, both reflect a common overarching objective: to contribute to the global climate mitigation goals of the Paris Agreement, particularly the long-term temperature goal set out in Article 2(1).[6] Given this shared foundation within the global climate regime,[7] it is hardly surprising that national and corporate efforts are increasingly seeking synergies.[8] This article examines one such synergy, the seemingly growing interest among European policymakers to leverage the VCM to support domestic GHG reduction and removal activities, with the aim of advancing national climate targets. The article argues that, without appropriate regulatory reforms, such reliance may risk undermining broader climate objectives, including those of the Paris Agreement.

Given the complexity of national and corporate climate target frameworks and their intricate interactions, this article advocates for applying systems thinking to the regulation of the VCM in Europe. Systems thinking, initially developed in quantitative fields like computer science and engineering,[9] is gaining prominence in qualitative legal scholarship[10] and sustainability research.[11] This approach helps manage complexity by viewing the world as an interconnected network of components working together as a cohesive system with a specific purpose.[12] In

land use change and forestry in the 2030 climate and energy framework, and amending Regulation (EU) No 525/2013 and Decision No 529/2013/EU [2018] OJ L156/1 (LULUCF Regulation).

[4] In this article, the term 'voluntary carbon market' refers collectively to diverse and fragmented private-sector markets where carbon credits are traded. 'Carbon credits', often also called 'carbon offsets', represent the climate benefits of GHG emission reduction, avoidance and removal projects, referred to in this article as 'climate projects'. By purchasing carbon credits, companies (and other entities and individuals) use climate benefits achieved outside their value chains to offset their own emissions, typically without being legally required to do so.

[5] Nicolas Kreibich and Lukas Hermwille, 'Caught in Between: Credibility and Feasibility of the Voluntary Carbon Market Post-2020' (2021) 21 *Climate Policy* 939, 942; Danick Trouwloon et al. 'Understanding the Use of Carbon Credits by Companies: A Review of the Defining Elements of Corporate Climate Claims' (2023) 7 *Global Challenges* 8.

[6] Paris Agreement (adopted 12 December 2015, entered into force 4 November 2016) 55 ILM 740.

[7] The term 'global climate regime' here refers to the principles and substantive rules that are relevant for the achievement of the mitigation objectives of international climate agreements, 'together with the institutions and procedural tools established to oversee their implementation, development and enforcement'. See Farhana Yamin and Joanna Depledge, *The International Climate Change Regime: A Guide to Rules, Institutions and Procedures* (Cambridge University Press 2004) 6–7.

[8] See e.g., *Synergy Solutions for Climate and SDG Action: Bridging the Ambition Gap for the Future We Want, Report on strengthening the evidence base*, 2nd edn. (UN 2024). See also Klas Wetterberg et al., *The Interplay between Voluntary and Compliance Carbon Markets: Implications for Environmental Integrity*, OECD Environment Working Papers No. 244 (OECD 2024) 11.

[9] Lynn M. LoPucki, 'Systems Approach to Law' (1997) 82 *Cornell Law Review* 479, 481. On the history and development of systems thinking, see Robert C. Bird and Julie Manning Magid, 'Toward a Systems Architecture in Corporate Governance' (2021) 24 *University of Pennsylvania Journal of Business Law* 84, 89–94.

[10] On systems analysis in legal research, see e.g., Charles Maechling 'Systems Analysis and the Law' (1976) 62 *Virginia Law Review* 721–36 and LoPucki (n 9) 479–522. See also Bird and Magid (n 9) 94 (and sources cited therein, n 56).

[11] N. Voulvoulis et al., 'Systems Thinking as a Paradigm Shift for Sustainability Transformation' (2022) 75 *Global Environmental Change* 1, 5.

[12] See e.g., Erin Betley et al., 'Introduction to Systems and Systems Thinking' (2021) 11 *Lessons in Conservation* 9, 12. Detailed discussion on the definition of 'systems thinking' is found in Ross D. Arnold and Jon P. Wade, 'A Definition of Systems Thinking: A Systems Approach' (2015), *Procedia Computer Science* 669–78.

this context, a 'system' is understood as a 'complex unity formed of many often diverse parts subject to a common plan or serving a common purpose'.[13] Systems typically consist of subsystems that operate both independently and in conjunction with one another, often containing their own internal subsystems.[14]

In the realm of climate governance, systems thinking allows for an analysis of the frameworks developed around national and corporate climate targets as interacting 'subsystems' within the broader 'system' of global climate objectives. Using systems thinking as a conceptual lens, this article compares key elements of these target-based frameworks. As the article demonstrates, this perspective helps in identifying and analyzing 'systemic challenges' arising from their interaction. A high-level perspective, or 'bird's-eye view,' on such challenges can be crucial to understanding how these interacting subsystems respond to specific national policies and measures.

The article is structured as follows: *Chapter 2* provides an overview of the EU's legal framework for achieving collective climate objectives, focusing on Member States' GHG reduction and removal targets. *Chapter 3* shifts the focus to the evolving landscape of corporate net-zero targets, particularly the role of the VCM in achieving these goals. *Chapter 4* explores the role of the VCM in achieving national climate targets in Europe. To that end, it examines the interplay between national and corporate climate target frameworks in Europe, framing them as distinct yet interconnected subsystems within the broader system of global climate objectives. Finally, conclusions are presented in *Chapter 5*.

[13] Bird and Magid (n 9) 89 (and sources cited therein, n 19). See also LoPucki (n 9) 482.

[14] LoPucki (n 9) 487.

2. National climate targets under EU law

2.1 National emission reduction and carbon removal targets

In their latest Nationally Determined Contribution (NDC) update, the EU and its Member States pledged to jointly reduce emissions by at least 55% by 2030, compared to 1990 levels, as a step towards achieving climate neutrality by 2050.[15] In line with this, the EU's substantive and procedural climate rules were significantly reformed under the 'Fit for 55' package, which incorporated the European Green Deal's long- and medium-term climate targets into the EU *acquis*.[16] To operationalize these targets, the EU has established a framework of interconnected mechanisms, each playing a critical role within a complex web of legal rules, institutions, procedures, and transparency requirements.[17]

[15] The Update of the Nationally Determined Contribution of the European Union and its Member States – Submission by Spain and the European Commission on behalf of the European Union and its Member States (16 October 2023), <https://unfccc.int/sites/default/files/NDC/2023-10/ES-2023-10-17%20EU%20submission%20NDC%20update.pdf> accessed 16 September 2024 (EU NDC 2023).

[16] See Karin Bäckstrand, 'Towards a Climate-Neutral Union by 2050? The European Green Deal, Climate Law, and Green Recovery' in Antonina Bakardjieva Engelbrekt et al. (eds), *Routes to a Resilient European Union* (Springer International Publishing 2022) 57.

[17] See further ibid 39–61. The transparency requirements include the obligation of Member States, under the 'Governance Regulation' to submit to the Commission a ten-year National Energy and Climate Plan (NECP) and biennial progress reports. Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council [2018] OJ L328/1 (Governance Regulation).

A key component of this framework is the national emission reduction and removal targets assigned to individual Member States.[18] Under the Effort Sharing[19] and LULUCF Regulations,[20] Member State are required to achieve specific, quantified mitigation outcomes within set timeframes.[21] Alongside the EU Emissions Trading System Directive (EU ETS Directive),[22] these regulations form the primary legal instruments for achieving the EU and Member States' NDC, covering all sectors and GHGs included in the NDC.[23]

2.1.1 National targets under the Effort Sharing Regulation

The Effort Sharing Regulation covers several multiple-source sectors within the EU, including domestic transport,[24] buildings, agriculture, small industry and waste.[25] The framework established under the regulation is intended to achieve a collective 40% emission reduction from these sectors within the EU during the period 2021–2030, compared to 2005 levels.[26] Guided by principles of fairness and solidarity,[27] the Effort Sharing Regulation allocates to each Member State a 'fair share' of this target through binding commitments, which range from 10% to 50% emission reduction requirements.[28]

The legal structure of these commitments is relatively straightforward, involving annual quantitative emission limitations for each Member State,[29] to be achieved within specific time periods. These limitations are translated into Annual Emission Allocations (AEAs), which decrease each year to achieve the overall Effort Sharing Regulation's target.[30]

2.1.2 National targets under the LULUCF Regulation

Similarly, under the LULUCF Regulation, Member States are subject to legal obligations to achieve certain quantified outcomes in the land use, land-use change and forestry (LULUCF) sectors.[31] Following the Fit for 55 amendments, the regulation includes an EU-wide target of net GHG removals of 310 million tons by 2030, based

[18] In the context of this article, a distinction needs to be made between the binding emission reduction and carbon removal targets established at EU level and the voluntary national targets set by individual Member States through their own national laws and policies. Such targets often exceed the EU-level targets and can vary in scope and structure. See further e.g., <https://www.un.org/en/climatechange/net-zero-coalition> accessed 16 September 2024.

[19] See n 2.

[20] See n 3.

[21] The Effort Sharing and LULUCF Regulations were incorporated into Protocol 31 of the Agreement on the European Economic Area (EEA Agreement) with Decision of the EEA Joint Committee No 269/2019 of 25 October 2019 amending Protocol 31 to the EEA Agreement, on cooperation in specific fields outside the four freedoms. EEA Supplement 2023/EEA/5/23, 32. This decision made Iceland and Norway subject to Effort Sharing and LULUCF targets, applying the same criteria as those used for EU Member States.

[22] Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a system for greenhouse gas emission allowance trading within the Union and amending Council Directive 96/61/EC, [2003] OJ L275/32 (EU ETS Directive).

[23] EU NDC 2023, 11.

[24] Excluding aviation.

[25] Effort Sharing Regulation, Article 2 (as amended by Article 1 of Regulation (EU) 2023/857 [2023] OJ L111/1).

[26] Effort Sharing Regulation, Article 1 (as amended by Article 1 of Regulation (EU) 2023/857 [2023] OJ L111/1).

[27] Effort Sharing Regulation, preamble, item 2.

[28] Effort Sharing Regulation, Article 4, see also individual targets set out in column 2 of Annex I (as amended by Article 1 of Regulation (EU) 2023/857 [2023] OJ L111/1).

[29] See Marjan Peeters and Natassa Athanasiadou, 'The Continued Effort Sharing Approach in EU Climate Law: Binding Targets, Challenging Enforcement?' (2020) 29 *RECIEL* 201.

[30] Effort Sharing Regulation, Article 4, see also Article 3(2) (as amended by Article 1 of Regulation (EU) 2023/857 [2023] OJ L111/1).

[31] The LULUCF sectors are defined in Article 2 of the LULUCF Regulation, (as amended by Article 1 of Regulation (EU) 2023/839 [2023] OJ L107/1).

on average emissions in 2016–2018.[32] However, individual national targets are more complex and nuanced than those under the Effort Sharing Regulation. In simplified terms, from 2021 to 2025, each Member State must ensure that all accounted GHG emissions from LULUCF activities are offset by at least an equivalent amount of accounted removals.[33] In the period 2026 to 2030, the commitments take the form of specific binding net carbon removal targets for each Member State,[34] determined based on factors such as its share of the managed land area and its capacity to improve its climate performance in the land-use sectors.[35]

2.1.3 Flexibilities and offsetting potential

To enhance cost-effectiveness of achieving the EU's climate objectives, Member States have significant flexibility in how they choose to meet their Effort Sharing and LULUCF targets, which partly involves interplay between these two instruments.[36] For example, Member States can use land-use-based carbon removals that exceed their LULUCF target to offset their Effort Sharing emissions, up to a certain level specified for each Member State.[37] Some Member States may also account a portion of allowances they could have auctioned under the EU ETS towards their Effort Sharing target.[38]

Moreover, Member States can sell a limited percentage of AEAs that exceed their needs for Effort Sharing compliance to other Member States.[39] Similarly, excess removals under the LULUCF Regulation can be traded.[40] These flexibilities and offsetting options effectively create intra-EU carbon markets at the state level, allowing Member States to trade specific types of emission units and carbon removals, thereby fulfilling their obligations at a lower cost than if restricted to actions within their own borders.[41] For the purposes of this article, it is important to note that all emission reductions and removals to be counted towards Effort Sharing and LULUCF targets must occur within the EU, and Member States cannot use credits from any external market mechanisms for compliance purposes. In contrast, until 2021, Member States were allowed to use certain types of international carbon credits issued under the Kyoto Protocol to implement their emission reduction obligations.[42]

[32] LULUCF Regulation, Article 4(2) (as amended by Article 1 of Regulation (EU) 2023/839 [2023] OJ L107/1).

[33] LULUCF Regulation, Article 4(1) (as amended by Article 1 of Regulation (EU) 2023/839 [2023] OJ L107/1). This rule is generally referred to as the 'no-debit rule'.

[34] LULUCF Regulation, Article 4(3), see also individual targets set out in column C of Annex IIa (as amended by Article 1 of Regulation (EU) 2023/839 [2023] OJ L107/1).

[35] See Regulation (EU) 2023/839, amending the LULUCF Regulation, preamble, item 8.

[36] Effort Sharing Regulation, Article 5(1)–(3) (as amended by Article 1 of Regulation (EU) 2023/857 [2023] OJ L111/1).

[37] LULUCF Regulation, Article 12(1) (as amended by Article 1 of Regulation (EU) 2023/839 [2023] OJ L107/1); Effort Sharing Regulation, Article 7 (as amended by Article 1 of Regulation (EU) 2023/857 [2023] OJ L111/1).

[38] Effort Sharing Regulation, Article 6 (as amended by Article 1 of Regulation (EU) 2023/857 [2023] OJ L111/1).

[39] Effort Sharing Regulation, Article 5(4)-(5) (as amended by Article 1 of Regulation (EU) 2023/857 [2023] OJ L111/1).

[40] LULUCF Regulation, Article 12(2) (as amended by Article 1 of Regulation (EU) 2023/839 [2023] OJ L107/1).

[41] See further: Peeters and Athanasiadou (n 29) 205–206.

[42] See Article 5 of Decision No 406/2009/EC of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the Community's greenhouse gas emission reduction commitments up to 2020 [2009] OJ L140/136 (Effort Sharing Decision).

3. Corporate climate action and the voluntary carbon market

3.1 Corporate net-zero targets

In the past decade, voluntary corporate climate action[43] has significantly increased[44] and become a prominent focus of scholarly research.[45] A notable trend within these efforts is the increasing number of companies independently setting their own climate targets, often labeled as 'net-zero' targets.[46] The concept of net-zero, which refers to the balancing of GHG emissions with an equivalent amount removed from the atmosphere, has gained substantial traction among corporations in recent years.[47]

However, the actual impact of these targets is often ambiguous and they differ widely in robustness and transparency, making it challenging to evaluate their achievement.[48] Many of these targets have faced criticism for being potentially misleading,[49] with some studies suggesting that they frequently fall short of their intended outcomes.[50] In response to such concerns, several standards and guidelines have emerged to help companies formulate credible targets aligned with the goals of the Paris Agreement.[51] While such initiatives have primarily been driven by private sector efforts,[52] regulators increasingly recognize the need for clearer guidelines and accountability.[53]

3.2 The voluntary carbon market

3.2.1 The evolving role of the voluntary carbon market in global climate action

The rise in corporate net-zero targets has significantly increased the demand for carbon credits in the VCM.[54] However, despite forecasts of continuing expansion and relevance in global climate governance,[55] the future of the VCM

[43] The term 'voluntary corporate climate action' here refers to climate initiatives that companies and other private entities choose to engage in beyond what is legally required.

[44] See e.g., Simon Dietz et al., 'An Assessment of Climate Action by High-carbon Global Corporations' (2018) 8 *Nature Climate Change* 1072–75. See also Priyadarshi R. Shukla et al. (eds), *Climate Change 2022: Mitigation of Climate Change. Contribution of Working Group III to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* (IPCC, 2022) 426.

[45] See e.g., Jonathan M. Gilligan and Michael P. Vandenbergh, 'A Framework for Assessing the Impact of Private Climate Governance,' (2020) 60 *Energy Research & Social Science*.

[46] See Thomas Hale et al., 'Assessing the Rapidly-emerging Landscape of Net Zero Targets' (2022) 22 *Climate Policy* 18–29.

[47] Sam Fankhauser et al., 'The Meaning of Net Zero and How to Get it Right' (2022)12 *Nature Climate Change* 15, 17.

[48] Hale et al., 'Assessing the Rapidly-emerging Landscape of Net Zero Targets' (n 46) 23; Kreibich and Hermwille (n 5) 941–42.

[49] Trouwloon et al. (n 5) 1–18.

[50] Anne-France Bolay *et al.* 'What Drives Companies' Progress on their Emission Reduction Targets?' (2024) 468 *Journal of Cleaner Production* 1, 2; Kreibich and Hermwille (n 5) 942.

[51] Of such initiatives, the most well-known is the Science Based Targets Initiative (SBTi), founded by CDP, the World Resources Institute (WRI), the World Wide Fund for Nature (WWF) and the United Nations Global Compact (UNGC) in 2015.

[52] See Kaya Axelsson et al., 'Is Impact out of Scope? A Call for Innovation in Climate Standards to Inspire Action Across Companies' Spheres of Influence' (2024) 15 *Carbon Management* 1.

[53] See Thomas Hale et al., 'Turning a Groundswell of Climate Action into Ground Rules for Net Zero' (2024) 14 *Nature Climate Change* 306, 306–307.

[54] The size of the VMC, by value of traded carbon credits, sharply increased between the years 2020 and 2021, from $534 million to $2.1 billion (respectively), but fell between 2022 and 2023, from $1.98 billion to $723 million (respectively). Alex Procton, *State of the Voluntary Carbon Market 2024: On the Path to Maturity* (Ecosystem Marketplace 2024) 4.

[55] See e.g. *Treeprint – Carbon Markets: The Beginning of the Big Carbon Age* (Credit Suisse 2022) 5 and Nasim Pour and Leila Toplic, 'Why the Voluntary Carbon Market is Key to Scaling Carbon Dioxide Removal and Delivering Net-zero' (6 September 2024) <https://www.weforum.org/agenda/2024/09/voluntary-carbon-market-carbon-dioxide-removal-net-zero/> accessed 18 September 2024.

remains uncertain.[56] This uncertainty stems, in part, from complex challenges regarding the interplay between the VCM and national climate commitments.[57] Additionally, much of this uncertainty relates to concerns over the market's integrity, underscored by a series of scandals which have cast doubt on its credibility, including allegations of overestimation of mitigation outcomes in large climate projects.[58] These controversies have triggered a crisis of confidence in the market, leading some to question the legitimacy of carbon offsets altogether.[59] One recurring critique of the VCM is that it allows developed countries and companies to continue their GHG emissions by offsetting through mitigation activities in developing countries.[60]

Proponents of the VCM argue that with effective management of the risks associated with the market, carbon offsets can play a vital role in global climate action by providing a crucial channel for climate financing.[61] Recognizing the challenges and flaws of the VCM, commentators have pointed out that these risks are, in fact, outweighed by the urgency for large-scale climate action and the pressing need to mobilize climate finance.[62] It has been noted that if global climate efforts are effective, the financial incentives of carbon markets will no longer be needed in a few decades, given that carbon prices will be 'fully incorporated into all market prices'.[63] Thus, as pointed out by *Streck*, while 'offsetting cannot replace efforts to reduce emissions […] it can serve as a transitional strategy to accelerate progress towards carbon neutrality'.[64] For the purposes of this article, it is worth mentioning that the VCM has not only been seen as a means to stimulate finance flow to developing countries, but also as one of the potential methods to be used by developed countries, under Article 9 of the Paris Agreement, to mobilize climate finance in general.[65]

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[56] See Jos Dalbeke et al., *Towards an EU Policy Agenda for Voluntary Carbon Markets*, STG Policy Papers: Policy Brief, ISSUE 2023/08 (EUI School of Transnational Governance 2023), 3; Kreibich and Hermwille (n 5) 941.

[57] Rob Macquarie, *The Voluntary Carbon Market and Sustainable Development*, Policy brief (Grantham Research Institute on Climate Change and the Environment 2023) 3.

[58] See e.g., Alejandra Padín-Dujon, 'The Verra Scandal Explained: Why "Avoided Deforestation" Credits are Hazardous' (26 January 2023) <https://blogs.lse.ac.uk/internationaldevelopment/2023/01/26/the-verra-scandal-explained-why-avoided-deforestation-credits-are-hazardous/> accessed 16 September 2024.

[59] See e.g., 'Global Charities Say Using Companies' Carbon Offsets to Lower Emissions Undermines Climate Targets' (2 July 2024) <https://www.wsj.com/articles/global-charities-say-using-companies-carbon-offsets-to-lower-emissions-undermines-climate-targets-b281a097?mod=WTRN_pos1&cx_testId=3&cx_testVariant=cx_189&cx_artPos=0> accessed 16 September 2024.

[60] See Joseph Romm, *Are Carbon Offsets Unscalable, Unjust, and Unfixable—and a Threat to the Paris Climate Agreement?* A White Paper from the Penn Center for Science, Sustainability, and the Media 17 and 43. <https://bpb-us-w2.wpmucdn.com/web.sas.upenn.edu/dist/0/896/files/2023/06/OffsetPaper7.0-6-27-23-FINAL2.pdf> accessed 16 September 2024.

[61] See Charlotte Streck, 'How Voluntary Carbon Markets can Drive Climate Ambition' (2021) 39 *Journal of Energy & Natural Resources Law* 367, 369; Oliver Miltenberger et al., 'The Good Is Never Perfect: Why the Current Flaws of Voluntary Carbon Markets Are Services, Not Barriers to Successful Climate Change Action', (2021) 3 *Frontiers in Climate* 1, 4–5.

[62] See Miltenberger et al. (n 61) 2.

[63] Ibid.

[64] Streck (n 61) 368. It should be noted, however, that current empirical evidence on the actual impact and effectiveness of the VCM remains insufficient to assess its contribution to global climate efforts. See B. Buma et al., 'Expert Review of the Science Underlying Nature-based Climate Solutions' (2024) 14 *Nature Climate Change* 402–406.

[65] *Defining Results-Based Climate Finance, Voluntary Carbon Markets and Compliance Carbon Markets*, World Bank Working Paper (World Bank 2022) 4. Article 9(3) of the Paris Agreement reads as follows: 'As part of a global effort, developed country Parties should continue to take the lead in mobilizing climate finance from a wide variety of sources, instruments and channels, noting the significant role of public funds, through a variety of actions, including supporting country-driven strategies, and taking into account the needs and priorities of developing country Parties. Such mobilization of climate finance

Recent scholarly discourse on the VCM has largely focused on issues of credibility and governance.[66] Like compliance markets, the VCM faces concerns regarding a variety of challenges, including environmental integrity,[67] non-additionality,[68] market manipulation,[69] lack of effectiveness,[70] and carbon leakage.[71] Some of these concerns are particularly acute in the VCM due to its self-regulated governance structure, which *Betz et al*. describe as 'an extreme case of involvement of private actors as sources of governance'.[72] In contrast to compliance markets, which are regulated by international agreements or specific laws, the VCM is primarily governed by independent certification organizations,[73] usually with limited oversight by governments or central institutions.[74]

Over time, these certification organizations have developed a set of core principles for the VCM, establishing widely accepted minimum standards for project validation, monitoring, and verification.[75] However, competition among private certification bodies, along with potential conflicts of interest, has created incentives for over-crediting and non-additionality, exacerbating existing integrity challenges.[76] Combined with limited governmental oversight, these factors increase the risk of abuses compared to compliance carbon markets.[77]

3.2.2 Calls for regulatory response

Efforts to improve the quality of carbon credits in the VCM and ensure market integrity have predominantly been led by private entities and NGOs. National regulators, on the other hand, have generally been reluctant to impose quality requirements on corporate offsets in the VCM or restrict their use.[78] Recently, calls have intensified for stronger regulatory oversight of

should represent a progression beyond previous efforts.' See analysis on this paragraph in Jorge Gastelumendi and Inka Gnittke, 'Climate Finance (Article 9)' in Daniel Klein et al. (eds), *The Paris Agreement on Climate Change – Analysis and Commentary* (Oxford University Press 2017) 244–45.

[66] See e.g., Kreibich and Hermwille (n 5); Streck (n 61); Jan Cornillie et al., *What Future for Voluntary Carbon Markets?* STG Policy Papers; Policy Brief, ISSUE 2021/08 (EUI School of Transnational Governance 2021).

[67] For an overview of scholarship on environmental integrity risks in international carbon markets, see Lambert Schneider and Stephanie La Hoz Theuer, 'Environmental Integrity of International Carbon Market Mechanisms under the Paris Agreement' (2018) 19 *Climate Policy* 386, 387.

[68] On the concept of additionality, see Axel Michaelowa et al., 'Additionality Revisited: Guarding the Integrity of Market Mechanisms under the Paris Agreement' (2019) 19 *Climate Policy* 1211–1224.

[69] Regina Betz et al., *The Carbon Market Challenge: Preventing Abuse Through Effective Governance* (Cambridge University Press 2022) 9.

[70] Schneider and La Hoz Theuer (n 67) 392–95.

[71] Alice Pirlot, 'Carbon Leakage and International Climate Change Law' (2024) 13 *Transnational Environmental Law* 61–86.

[72] Betz et al. (n 69) 8.

[73] A small number of such organizations issue most carbon credits on the VCM, including Verra, Gold Standard and American Carbon Registry.

[74] See Vittoria Battocletti et al., 'The Voluntary Carbon Market: Market Failures and Policy Implications' (2024) 95 *University of Colorado Law Review* 519, 521.

[75] See e.g. the Carbon core principles of the Integrity Council for the Voluntary Carbon Market (ICVCM), <https://icvcm.org/core-carbon-principles/> and the Oxford Principles for Net-zero Aligned Carbon Offsetting, <https://www.smithschool.ox.ac.uk/sites/default/files/2024-02/Oxford-Principles-for-Net-Zero-Aligned-Carbon-Offsetting-revised-2024.pdf>, both accessed 17 September 2024.

[76] Betz et al. (n 69) 22; Battocletti et al. (n 74) 550.

[77] Betz et al. (n 69) 21.

[78] However, governments are increasingly publishing non-binding guidelines and principles for the VCM to enhance its integrity. See e.g., recent examples from the United States, *Voluntary Carbon Markets Joint Policy Statement and Principles* (White House 2024) and Finland, Anna Laine et al., *Guide to Good Practices for Voluntary Carbon Markets: Supporting Voluntary Mitigation Action with Carbon Credits* (Finnish Government 2023).

both corporate net-zero targets[79] and VCM operations.[80] In that discussion, the application of various governmental capabilities has been suggested, including different means to influence the integrity of the supply side, demand side and market operations.[81] While the nature and scope of such regulatory interventions remain a subject of debate,[82] among recurring themes in this discussion is the need for governments to clarify the 'legal status of credits and rights to generate, own and use them'.[83] In light of the uncertainty surrounding the VCM, it has been noted that 'clear signals of regulatory intent are key to the supply of high-quality credits given that unpredictability harms confidence to invest'.[84]

In this context, it should be noted that recent regulatory developments on the demand side of the VCM are expected to influence offsetting practices.[85] This includes legal developments in areas such as consumer protection and corporate sustainability disclosures, where companies are required to substantiate their net-zero claims and disclose relevant information, which may curb the misuse of offsets.[86] Alongside this, the rise of greenwashing litigation may compel companies to exercise greater caution when using offsets to meet their net-zero targets, in order to avoid legal and reputational risks.[87]

4. The role of the voluntary carbon market in achieving national climate targets in Europe? The case for systems thinking

4.1 Regulating the VCM – European context

While the VCM is widely recognized for its role in mobilizing private capital for climate action,[88] its interaction with national mitigation measures introduces notable challenges. Concerns around issues such as double claiming and non-additionality[89] have received considerable attention in both scholarly and public discourse about the VCM,[90] and have contributed to growing calls for regulatory intervention. However, these discussions have largely focused on VCM projects in the Global South, which typically are funded by entities (states and non-state actors) from the Global North.[91] In contrast, there is limited academic research on the implications of the increasing number of VCM projects occurring within developed countries, including EU Member States. Although VCM transactions within and between developed countries share many challenges with those involving both developing and developed countries, the distinct legal context in developed regions, such as the EU, may give rise to unique variations of these challenges, discussed further in this chapter.

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[79] See e.g., Hale et al., 'Turning a Groundswell of Climate Action into Ground Rules for Net Zero' (n 53) 306–308 and Rosalie Arendt, 'Residual Carbon Emissions in Companies' Climate Pledges: Who has to Reduce and Who Gets to Remove?' (2024) *Climate Policy* 1–16.

[80] See e.g. *Voluntary Carbon Markets and Offsetting* (UK Climate Change Committee 2022) 83.

[81] Wetterberg et al. (n 8) 46.

[82] See Battocletti et al. (n 74) 557; Bryce A. Davis, 'A Climate Solution on Shaky Ground: The Voluntary Carbon Market and Agricultural Sequestration' (2023) 3 *University of Illinois Law Review* 955, 978.

[83] See Macquarie (n 57) 4.

[84] Ibid.

[85] See e.g., Jan Cornillie, *Can the New European Sustainable Finance Rules Improve the Integrity of Voluntary Carbon Markets?* STG Policy Papers, Policy Brief, ISSUE 2022/28 (EUI School of Transnational Governance 2022) 5.

[86] See Dalbeke et al. (n 56) 5–8. See also Cornillie (n 85) 4.

[87] Nicolas Kreibich et al., *Governing Corporate Claims: Increasing transparency of climate-related claims*, Carbon Mechanisms Research Policy Paper No. 03/2022 (Wuppertal Institute for Climate, Environment and Energy 2022) 27–28.

[88] See e.g., Streck (n 61).

[89] Double claiming and non-additionality will be further discussed in Chapter 4.2.3.

[90] See e.g., Michaelowa et al. (n 68); Kreibich and Hermwille (n 5); Betz et al. (n 69) 50-53; Battocletti et al. (n 74) 531–34.

[91] See e.g., Streck (n 61), 368–69; Battocletti et al. (n 74) 526–27; Trouwloon et al. (n 5) 14; Macquarie (n 57) 2.

As highlighted in the introduction, this article contends that, without appropriate regulatory reforms, European policymakers' reliance on VCM activities to support national climate targets could potentially undermine broader climate goals, including those of the Paris Agreement. Drawing on discussions from previous chapters, the article further argues that effectively regulating the VCM in Europe requires a comprehensive understanding of the intricate interactions between national and corporate climate target frameworks. Using systems thinking as a conceptual lens, the following chapters will provide a high-level perspective on the interaction between these two frameworks, in order to address the dynamic and multifaceted regulatory challenges involved.

4.2 Interplay between national and corporate climate target frameworks

4.2.1 Leveraging the VCM for national climate targets

Evidence from around the world shows an increasing interplay between climate-related compliance instruments[92] and the VCM, with policymakers actively seeking to leverage the VCM to stimulate private investments in climate projects.[93] Here, 'leveraging the VCM' broadly refers to any kind of efforts to mobilize, through public policy, private finance through the VCM, by enabling, facilitating or encouraging the participation of non-state entities, including companies, in VCM activities and transactions.

This approach is not new. International climate market mechanisms tapping into voluntary private efforts date back to the Kyoto Protocol, which explicitly enabled private entities to participate in the generation of credits to help Annex I parties meet their quantified emission reduction commitments.[94] A similar strategy is now emerging under Article 6(4) of the Paris Agreement, which also envisions voluntary participation by private entities in a state-level carbon crediting mechanism.[95] Another example at the international level is the Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA),[96] which, under certain conditions, permits the use of VCM credits as 'eligible emissions units' for compliance purposes.[97]

Reliance on the VCM at the domestic level is, on the other hand, relatively recent, although a small number of countries, including Switzerland and Australia, have a history of integrating the VCM into national compliance mechanisms.[98] Now, however, more variations of this

[92] 'Climate-related compliance instruments' here refers to any type of legally mandated tools or mechanisms aimed at advancing climate mitigation objectives.

[93] See e.g., Wetterberg et al. (n 8). See also Eve Tamme, 'The Convergence of the Voluntary and Compliance Carbon Markets' (9 November 2023) <https://evetamme.com/2023/11/09/converging-vcm-and-compliance-markets/> accessed 14 September 2024.

[94] Kyoto Protocol, Articles 6(3) and 12(9). Kyoto Protocol to the United Nations Framework Convention on Climate Change (adopted 11 December 1997, entered into force 16 February 2005) 37 ILM 22.

[95] Paris Agreement, Article 6(4)(b). See also e.g., Decision 3/CMA.3 (2021) Rules, modalities and procedures for the mechanism established by Article 6, paragraph 4, of the Paris Agreement, Annex (V)(A)(30), FCCC/PA/CMA/2021/10/Add.1. See further Jürg Füssler et al., *Incentives for Private Sector Participation in the Article 6.4 Mechanism*, Discussion Paper (German Emissions Trading Authority 2019).

[96] See Assembly Resolutions In Force (as of 7 October 2022), Doc. 10184, A41-22: Consolidated statement of continuing ICAO policies and practices related to environmental protection – Carbon Offsetting and Reduction Scheme for International Aviation (CORSIA) (International Civil Aviation Organization 2022).

[97] The International Civil Aviation Organization (ICAO) regularly publishes a list of programmes which are approved by the ICAO Council to supply units that airlines can use to comply with their offsetting requirements. See the most current one: *CORSIA Eligible Emissions Units: March 2024* (ICAO 2024).

[98] See Allegra Dawes et al., *Voluntary Carbon Markets: A Review of Global Initiatives and Evolving Models*, CSIS Briefs (CSIS 2023) 5–6 and Giulio Galdi et al., *Emissions Trading Systems with Different Offsets Provisions: Implica-*

approach appear to be emerging across the globe, many of which display elements of 'regulatory experimentalism'.[99] These include measures taken by several EU Member States in recent years to leverage the VCM to support their national climate targets. Sweden and Denmark, for instance, have each established funding mechanisms for BECCS projects,[100] based on blended public-private financing models that partly rely on the VCM.[101] Countries such as France, Austria, Germany, Italy, the Netherlands, and Spain, have developed official certification frameworks for issuing VCM carbon credits from domestic projects that mostly target land-use practices.[102] In Iceland, tax incentives are offered to companies that offset their own emissions through funding of climate projects.[103]

This experimental approach is also evident at the EU level. Proposed legal frameworks for 'carbon farming'[104] and the Carbon Removals Certification Framework (CRCF)[105] aim to enable private actors to generate carbon credits within the EU for sale on the VCM.[106] The EU thus appears open to harness the economic incentives of the VCM to promote both nature-based and technological carbon removals across Europe.

These examples suggest that Member States and the EU are increasingly turning to the VCM to mobilize climate finance for mitigation efforts, particularly for scaling up technological carbon removals and advancing land-use-based carbon farming. This shift signifies a transformation in the VCM's role, evolving from being merely an 'avenue of choice'[107] for voluntary climate action to becoming a crucial instrument for meeting the goals of the Paris Agreement.[108] As noted earlier, this also reflects a geographic shift in VCM projects. Historically, VCM projects were predominantly located in developing countries and funded by entities in developed nations, which offered lower-cost emission offsets for advanced

tions for Linking, Report for the Carbon Market Policy Dialogue, Research Project Report, Issue 2022/01 (Florence School of Regulation 2022) 21.

[99] Examples of such initiatives in the context of land-use-based carbon sequestration (carbon farming) are discussed in Nidhi Raina et al., 'Incentive Mechanisms of Carbon Farming Contracts: A Systematic Mapping Study' (2024) 352 *Journal of Environmental Management* 1, 7-10. On 'regulatory experimentalism' see Megan Bowman, *Regulatory Leadership for a Net Zero Transition: Central Banks and Financial Regulators: Levers and Limits* (King's College London 2022), 24–31.

[100] BECCS stands for 'bioenergy with carbon capture and storage' and involves capturing and storing CO_2 from biomass energy generation.

[101] For a discussion of these initiatives, see (for Sweden) Malin Dufour et al., 'How to Maintain Environmental Integrity when Using State Support and the VCM to Co-finance BECCS Projects – a Swedish Case Study' (2024) 12 *Frontiers in Environmental Science* 1–12 and (for Denmark) Jean-Philippe Brisson et al., *Denmark to Allow Stacking of Voluntary Carbon Credits and Nationally Determined Contribution*, June 20, 2024 <https://www.globalelr.com/2024/06/denmark-to-allow-stacking-of-voluntary-carbon-credits-and-nationally-determined-contribution/> accessed 14 September 2024.

[102] See an overview of these initiatives in Mengxue You and Sylvain Delerce, *The Low-carbon Label: A French Approach to Improving the Voluntary Market for Emissions Reductions and Removals*, Policy Brief (Carbon Gap 2023) 5.

[103] Income Tax Act (Lög um tekjuskatt) No 90/2003 (with later amendments), Article 31(2).

[104] Proposal for a Regulation of the European Parliament and of the Council establishing a Union certification framework for permanent carbon removals, carbon farming and carbon storage in products, 2022/0394 (COD).

[105] Proposal for a Regulation of the European Parliament and of the Council establishing a Union certification framework for carbon removals, COM/2022/672 final.

[106] For an overview of these proposals, including their relationship to the voluntary carbon market, see Sanja Bogojević, 'Carbon removals, ecosystems and the European Green Deal' (2024) 3 *European Law Open* 199–208.

[107] Markus Gehring and Freedom-Kai Phillips, *Intersections of the Paris Agreement and Carbon Offsetting: Legal and Functional Considerations*, Policy Brief No 88 (CIGI 2016) 1.

[108] See e.g. a policy statement and principles issued by the Biden-Harris Administration in the United States in May 2024, noting inter alia that '[h]igh-integrity voluntary carbon credit markets (VCMs), as well as carbon credit markets more broadly, have the potential to support decarbonization efforts within the United States and globally'. *Voluntary Carbon Markets Joint Policy Statement and Principles* (White House 2024), 1.

economies with limited 'low hanging fruit'.[109] Today, developed countries appear to be utilizing the VCM as a tool to finance domestic climate efforts.

4.2.2 *Comparison of key elements*

At first glance, the concurrent expansion of national and corporate climate target frameworks, both aligned with global climate goals, appears to be mutually beneficial. Although empirical evidence remains limited,[110] a recent study – the first to quantify the reciprocal relationship between these two levels of climate action – found a 'statistically significant and positive influence' between national and corporate climate targets.[111] According to its authors, this supports the theory of an 'ambition loop', where national and corporate climate action reinforces each other through shared ambition signaling.[112]

However, translating this shared ambition into effective implementation is challenging. While the frameworks developed around national and corporate climate targets essentially pursue the same overarching objective (the Paris Agreement's temperature goal), they differ significantly in architecture and functions, which raises questions about their ability to work together towards a shared goal. As demonstrated in the following three subchapters, which compare national and corporate climate target frameworks in Europe, these disparities include the formulation and scope of targets, methods for achieving targets (mitigation methods) and governance structures.

4.2.2.1 *Formulation and scope of targets*

The difference between the target-setting techniques of national and corporate frameworks is, at least partly, the result of different underlying drivers. As discussed in Chapter 2, the EU and its Member States pledged, in their joint NDC under the Paris Agreement, to collectively achieve at least 55% GHG emission reduction by the year 2030, compared to 1990. To achieve this target,[113] each EU Member State has undertaken quantified, legally binding emission reduction and removal targets under the Effort Sharing and LULUCF Regulations,[114] representing its contribution to the collective target.[115] In contrast, companies typically adopt climate targets voluntarily, motivated not by specific legal commitments but by factors such as stakeholder demands and reputational benefits.[116] The definition and ambition levels of corporate targets are thus determined by the companies themselves.[117] Although companies increasingly adhere to widely recognized standards and methodologies developed by independent

[109] See e.g., Shukla et al. (n 44) 814.
[110] Shaikh Eskander et al., 'Testing the Ambition Loop: Do Country- and Company-Level Net-Zero Targets Reinforce Each Other? A Global Comparison' (2024) 26 *Journal of Comparative Policy Analysis: Research and Practice* 3–4, 267.
[111] Ibid 273, 278.
[112] Ibid 267.
[113] The 55% target was made legally binding in the 'European Climate Law'. Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 [2021] OJ L243/1 (European Climate Law), Article 1 and preamble, item 8.
[114] See further Chapters 2.2.1 and 2.2.2.
[115] Under the procedural framework set out in the European Climate Law and the Governance Regulation, the EU is set to revise its interim target, which will lead to updating of national targets in the Effort Sharing and LULUCF Regulations.
[116] Zola Berger-Schmitz et al., 'What Explains Firms' Net Zero Adoption, Strategy and Response?' (2023) 32 *Business Strategy and the Environment* 5583, 5587–88. However, legal requirements in various fields, including financial regulation, and rules to promote fair competition and consumer protection, increasingly influence the formulation of these targets.
[117] See Hale et al. 'Assessing the Rapidly-emerging Landscape of Net Zero Targets' (n 46) 21–22.

bodies,[118] the formulation of their targets can vary considerably.[119]

The scope of the targets is subject to similar differences. The Effort Sharing and LULUCF targets cover emissions and removals of an exhaustive list of GHGs from specific categories of activities occurring within the territory of the Members States. The Effort Sharing and LULUCF Regulations, together with the EU ETS Directive, are designed to ensure comprehensive coverage and control of the GHGs that are included in the EU and Member States' NDC. On the other hand, the scope of corporate climate targets is not harmonized, and companies define their own 'target boundaries'. Thus, the companies themselves determine the permissible type and geographic location of emissions reduction and removal activities falling under their targets' scope.[120] Consequently, these targets range significantly in scope. For example, some corporate targets encompass all GHGs, while others focus exclusively on CO_2.[121] Similarly, some targets address only direct emissions whereas others also include indirect emissions, *i.e.* emissions that result from the company's activities but occur at sources owned or controlled by another entity.[122]

4.2.2.2 Mitigation methods

Another notable difference between the national and corporate frameworks lies in the accepted methods for achieving climate targets. While EU Member States generally select their own policies and measures to meet climate targets, their choices are heavily influenced by various harmonized EU measures.[123] In contrast, the voluntary nature of corporate climate targets allows companies significant flexibility in how they achieve their targets, resulting in varied mitigation methods across corporate targets. This distinction also applies to offsetting options. As discussed earlier, EU Member States' national targets can be partially met through specific offsetting methods, governed by rules and restrictions in the Effort Sharing and LULUCF Regulations.[124] These offsetting options are limited to state-level transfers of mitigation outcomes, and except for certain emission allowances transferable from the EU ETS,[125] carbon credits or units from other market mechanisms are not accepted for compliance. Corporate climate targets, by contrast, do not face these limitations; companies can typically choose the volume, type, and geographical origin of carbon credits used to offset residual emissions.[126]

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[118] Berger-Schmitz et al. (n 116) 5585.

[119] In practice, however, many corporate targets are formulated similarly to national targets, for example by including a long-term goal to be achieved by a specific year and one or more intermediate targets. See e.g., *SBTi Corporate Net-zero Standard*, Version 1.2 (SBTi 2024) 41–42.

[120] See Thomas Hale et al., 'Assessing the Rapidly-emerging Landscape of Net Zero Targets' (n 46) 22. See also *SBTi Corporate Net-zero Standard* (n 119) 24–27.

[121] Hale et al., 'Assessing the Rapidly-emerging Landscape of Net Zero Targets' (n 46) 22.

[122] Ibid. See also *Calculation Tools FAQ*, Information on the Greenhouse Gas Protocol's website, <https://ghgprotocol.org/calculation-tools-faq> accessed 18 September 2024. Direct emissions are typically categorized as Scope 1 emissions, while indirect emissions are divided into Scope 2 emissions, which relate to consumption of purchased energy, and Scope 3 emissions, namely '[o]ther indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. T&D losses) not covered in Scope 2, outsourced activities, waste disposal, etc.' ibid.

[123] See e.g. Effort Sharing Regulation, preamble, Item 8.

[124] See further Chapter 2.2.3.

[125] Effort Sharing Regulation, Article 6 (as amended by Article 1 of Regulation (EU) 2023/857 [2023] OJ L111/1).

[126] However, as noted earlier, certain widely accepted quality criteria for carbon offsetting are considered minimum standards. These include additionality, permanence, accurate monitoring and reporting, avoidance of carbon leakage, avoidance of double counting and the 'do no significant harm' principle. See e.g. a detailed overview of the minimum criteria in a guidance document for the VCM, issued by the Finnish Government in 2023, Anna Laine et al. (n 78) 16-58. 'Almost all carbon crediting programmes apply internationally established

4.2.2.3 *Governance structures*

Finally, the governance frameworks for implementing national and corporate climate targets differ significantly. EU Member States operate within a highly structured procedural framework, where the EU Commission monitors progress toward national targets.[127] This framework includes regular planning and reporting obligations, compliance procedures, and standardized accounting and reporting rules to ensure consistency across the EU. In contrast, corporate climate targets are implemented in a more fragmented, ad hoc manner.[128] Although independent standards and guidance have evolved into widely accepted best practices,[129] and various integrity initiatives address credit issuance, accounting, registration, and credit usage,[130] no overarching structure exists to comprehensively track and enforce corporate progress.[131]

4.2.3 *Systemic challenges*

The differences between national and corporate climate target frameworks in Europe, discussed above, raise questions about potential synergies and conflicts. While these frameworks largely operate independently, they are becoming more interconnected. This increasing interaction is, at least partly, driven by policymakers' growing reliance on voluntary climate initiatives, like VCM activities, to help meet national targets.[132]

From a systems thinking perspective, achieving the goals of a larger system requires the effective functioning of its interconnected 'subfunctions'.[133] In the situation explored in this article – where EU Member States use the VCM to support national climate targets – two subsystems are in fact attempting to work together to achieve a common climate objective. While the structural and functional differences of these subsystems do not necessarily prevent effective collaboration, systems thinking literature suggests that such disparities can lead to internal inconsistencies[134] and negative feedback loops.[135] These dynamics can cause unintended consequences that could ultimately undermine the broader system's goals.[136] This article argues that systems thinking offers valuable insights into these complexities of national and corporate climate target frameworks – and their interactions – which can help identify potential 'error[s] or untoward results'[137] that may lead to a 'malfunctioning system'.[138]

When an EU Member State encourages or facilitates voluntary climate action, such as VCM projects, to support its national climate targets, a key question arises: Can both the national and corporate players involved achieve their goals through this interaction? In this si-

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minimum criteria with a view to ensuring the quality of carbon credits', ibid. 16. Also, independent standards and guidelines frequently recommend that companies prioritize absolute emission reductions and only use offsets for 'residual emissions' (also called 'hard-to-abate emissions') which refers to emissions that remain after a company has taken all reasonable mitigation measures.

127 See e.g. Governance Regulation, Chapter 5.

128 *Taskforce on Scaling Voluntary Carbon Markets*, Final report (TSVCM 2021) 43.

129 Berger-Schmitz et al. (n 116) 5584.

130 Examples include various accounting standards of Greenhouse Gas Protocol, the Net Zero Standard of the Science Based Targets initiative's (SBTi), the Core Carbon Principles (CCPs) of the Integrity Council for the Voluntary Carbon Market (ICVCM) and the Claims Code of the Voluntary Carbon Markets Integrity Initiative (VCMI).

131 However, some private initiatives provide transparency on target implementation. See especially The Net Zero Tracker, <https://zerotracker.net/about> accessed 14 September 2024.

132 See examples in Chapter 4.2.1.

133 See LoPucki (n 9) 504.

134 LoPucki (n 9) 506.

135 Tamara Belinfanti and Lynn Stout, 'Contested Visions: The Value of Systems Theory for Corporate Law' (2018) 166 *University of Pennsylvania Law Review* 579, 604.

136 LoPucki (n 9) 502–503.

137 See id. 497.

138 Ibid.

tuation, the Member State is in fact leveraging the framework which has developed around corporate climate targets, including its incentives and infrastructure, to meet its own objectives. Meanwhile, the companies in question expect to use this same framework to achieve their own goals. However, given the substantial differences in scope, methods, and governance between national and corporate frameworks, it is not guaranteed that corporate climate actions will seamlessly align with national benefits or interests. This misalignment, as systems thinking suggests, can lead to 'systemic challenges'.[139] The following two subchapters will zoom in on two such potential challenges, double claiming and non-additionality.

4.2.3.1 National-corporate double claiming

The issue of national-corporate double claiming arises from the overlap of mitigation activities between national and corporate climate target frameworks. As one form of double counting,[140] double claiming involves two or more different entities using the same mitigation outcome to compensate for their respective emissions toward two or more separate targets.[141] Such practices, if widespread, may potentially undermine global climate objectives, as they can 'delay climate action [and] create a misleading picture that emissions have been reduced by more than they actually have in reality'.[142]

The question of how to address national-corporate double claiming is the subject of ongoing scholarly and public debate.[143] Emphasizing integrity challenges and the risk of undermining global climate objectives, some have argued that cross-border VCM transactions should be 'adjusted' in national accounting inventories to prevent double claiming.[144] Others have expressed the view that such a requirement is unnecessary as the mitigation outcomes belong to separate accounting systems.[145] In this context, it has also been pointed out that rigidly linking national and corporate accounting to avoid double claiming would impose excessive limitations on the VCM's ability to finance climate action.[146]

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[139] Here, that term refers to challenges which arise from tensions between national and corporate targets systems, potentially disrupting the effectiveness of both.

[140] The risk of double counting, *i.e.* counting the same mitigation outcome more than once against climate targets, is among major challenges of carbon markets at all levels. It manifests itself in three main ways: 1) *double issuance*, where more than one credit is issued on basis of the same mitigation result, 2) *double claiming*, where the same mitigation outcome is counted towards two or more climate targets, and 3) *double use*, where the same credit is used more than once to achieve a climate target. Betz et al. (n 69) 50–51.

[141] Schneider and La Hoz Theuer (n 67) 389; Kreibich and Hermwille (n 5) 940, 951; Hanna-Mari Ahonen et al., *Raising Climate Ambition with Carbon Credits: Exploring the Roles and Interplay of the Voluntary Carbon Markets and Article 6 in Contributing to the Implementation of National Climate Targets and Raising Global Ambition*, Discussion Paper (Perspectives Climate Group 2023).

[142] See Jonathan Crook, 'Was COP27 the beginning of the end for corporate offsetting?', <https://carbonmarketwatch.org/2022/12/07/was-cop27-the-beginning-of-the-end-for-corporate-offsetting/> accessed 14 September 2024.

[143] See an overview of key arguments of this debate in Wetterberg et al. (n 8) 25.

[144] For example, Kreibich and Hermville maintain that adjusting national bookkeeping under the Paris Agreement to reflect VCM transactions is the 'only solution that strengthens and protects the legitimacy of using carbon credits for offsetting in the context of carbon neutrality targets while ensuring a high degree of environmental integrity'. Kreibich and Hermwille (n 5) 951. See references to other sources where similar views are expressed in Charlotte Streck et al., *Double Claiming and Corresponding Adjustments: A Deep Dive into the Double Counting of Emission Reductions, Corresponding Adjustments, and their Implications for the Voluntary Carbon Market* (Climate Focus 2023) 5.

[145] Andrew Howard and Sandra Greiner, *Accounting Approaches for the Voluntary Carbon Market* (VCM Global Dialogue 2021), <https://vcm-gd.org/wp-content/uploads/2021/10/VCM_Accounting-1.pdf> accessed 14 September 2024.

[146] Streck et al. (n 144) 29; Ahonen et al. (n 141) 50.

This debate typically centers on the interaction between the VCM and state-level carbon trading under the Paris Agreement, and whether cross-border VCM transactions should be backed by 'corresponding adjustments' – an accounting tool established in the Article 6 Rulebook[147] to prevent double counting of mitigation outcomes between two national registries.[148] While that question, in principle, also applies to VCM transactions involving intra-EU climate projects, the distinctive legal framework governing EU-mandated national climate targets introduces unique legal implications that demand more context-specific research.

As mentioned above, the EU and its Member States have a joint NDC under the Paris Agreement, on the basis of which the EU has created legally binding emission reduction and removal targets for individual Member States.[149] While the EU legal framework allows specific transfers of mitigation outcomes between individual Member States,[150] it does, unlike the Article 6 Rulebook, not enable 'corresponding adjustments'. As a result, EU Member States cannot 'adjust' their national accounting for cross-border VCM transactions originating from intra-EU climate projects. Thus, when mitigation outcomes achieved through the VCM fall under the scope of the Effort Sharing or LULUCF Regulations, the host Member State must count these outcomes toward its national targets.[151] At the same time, a company purchasing the corresponding carbon credits is likely using the same mitigation outcomes to offset its residual emissions to achieve its own climate target.

This dual use of mitigation outcomes heightens the challenge of national-corporate double claiming under the EU legal framework. Addressing this issue may be even more difficult than under Article 6 of the Paris Agreement, as Member States lack the ability to adjust their national accounting to reflect VCM-related exports of carbon credits. From a systems thinking perspective, this situation indicates internal inconsistencies between national and corporate climate target frameworks (systems) in Europe, potentially leading to unintended consequences for the overall system's goal. To address such inconsistencies, adaptation may be needed within either or both systems – such as the introduction of new mechanisms to adjust the Member States' accounting or other kind of alignment or coordination between the national compliance framework and the VCM.

4.2.3.2 Non-additionality

The issue of non-additionality is another example of a potential systemic challenge arising from the interaction between national and corporate climate target frameworks in Europe. 'Additionality' is a core criterion of the VCM, requiring that carbon credits from VCM projects represent mitigation outcomes that would not have occurred without the revenue from selling these credits.[152] Demonstrating additionality in-

[147] 'Article 6 Rulebook' here refers to decisions on the implementation of the Paris Agreement's Article 6 made by the Conference of the Parties to the UNFCCC serving as the meeting of the Parties to the Paris Agreement (CMA). An overview of these decisions can be found here: <https://unfccc.int/process/the-paris-agreement/cooperative-implementation> accessed 14 September 2024.

[148] See e.g., Decision 2/CMA.3 (2021) Guidance on cooperative approaches referred to in Article 6, paragraph 2, of the Paris Agreement), Annex (III), FCCC/PA/CMA/2021/10/Add.1. For further information on corresponding adjustment, see e.g., Kreibich and Hermwille (n 5) 947 and onwards.

[149] See further Chapters 2.2.1 and 2.2.2.

[150] See further Chapter 2.2.3.

[151] See Governance Regulation, Article 26(3), cf. Annex V (Part 1) (as amended by Article 2 of Regulation (EU) 2023/857 [2023] OJ L111/1).

[152] On additionality in general, see e.g., Michaelowa et al. (n 68) 1213–1214 and James Salzman and David Weisbach, 'The Additionality Double Standard' (2024)

volves establishing a theoretical baseline of what would have happened under a business-as-usual scenario, a task complicated by the need to predict future developments based on subjective assumptions and often complex modeling.[153]

While non-additionality is a risk in most VCM transactions, the stringency of Member States' commitments under EU law makes it particularly challenging for intra-EU climate projects. The Effort Sharing and LULUCF Regulations not only impose national emission reduction and removal targets for the Member States but also prescribe robust ground rules on how to achieve them, including an exhaustive list of flexibilities and offsetting mechanisms, confined to intra-EU state-level carbon trading.[154]

Furthermore, under the Governance Regulation, Member States must submit a ten-year National Energy and Climate Plan (NECP) and report regularly on their progress, allowing the EU Commission to continually assess whether the Member States are on track to meet the EU's collective climate targets.[155] These rules require a high degree of transparency about planned future developments within the Member States. For example, the NECP shall include a description of their planned policies and measures for achieving their Effort Sharing and LULUCF targets, 'as well as a general overview of the investment needed' to meet these targets.[156]

This regulatory framework makes demonstrating additionality in intra-EU VCM projects even more challenging than in the traditional VCM model, which typically involves financial flows from developed to developing countries.[157] Developing countries are usually subject to less stringent climate targets than the EU Member States and often have conditional NDCs, *i.e.* they pledge to meet specific targets contingent on financial support.[158] This allows 'additional' mitigation outcomes to be achieved through market mechanisms like the VCM. In contrast, the compliance mechanisms of the Effort Sharing and LULUCF Regulations, along with the Governance Regulation, leave little room for unplanned activities within the Member States, thereby limiting the potential for EU-based projects to demonstrate additionality. This challenge is further complicated by the recently emerging concept of 'regulatory additionality',[159] which requires VCM projects to be 'additional to, and not required or enabled by, policies and measures that the host government has introduced'.[160]

Even if VCM projects fall outside the scope of the Effort Sharing and LULUCF Regulations,[161] the additionality requirement may still lead to systemic challenges. As additionality is a requirement for issuing VCM carbon credits, EU Member States may face perverse incentives to

48 *Harvard Environmental Law Review* 117, 123–129. See also Betz et al. (n 69) 16 (Table 3).

153 See further, Axel Michaelowa and Igor Shishlov, 'Evolution of International Carbon Markets: Lessons for the Paris Agreement' (2019) 10 *Wiley Interdisciplinary Reviews: Climate Change*.

154 See further Chapter 2.2.3. Importantly in this context, Member States are not allowed to use carbon credits from the VCM to achieve their Effort Sharing and LULUCF targets.

155 See Kati Kulovesi et al., 'The European Climate Law: Strengthening EU Procedural Climate Governance?' (2024) 36 *Journal of Environmental Law* 23, 27 and 32–34.

156 Governance Regulation, Article 3(2)(c).

157 See further Chapter 4.1.1.

158 On contingent NDCs, see W. P. Pauw et al., 'Conditional Nationally Determined Contributions in the Paris Agreement: Foothold for Equity or Achilles Heel?' (2020) 20 *Climate Policy* 468–84.

159 See Betz et al. (n 69) 72.

160 A practitioner's guide: Aligning the Voluntary Carbon Market with the Paris Agreement test (Gold Standard, 2024), <https://www.goldstandard.org/publications/a-practitioners-guide-aligning-the-voluntary-carbon> accessed 14 September 2024.

161 Such projects could include technological carbon capture projects like direct air capture and carbon storage (DACCS) or projects involving carbon sequestration through costal and marine ecosystems (blue carbon projects).

reduce ambition in future revisions of collective EU targets, to 'leave room' for additionality.[162] From a systems thinking perspective, this reflects a negative feedback loop, where action in one subsystem trigger counterproductive responses in another, potentially undermining the broader system's goals.[163]

Overall, these situations illustrate a tension between national and corporate climate target frameworks in Europe. This tension stems from a conflict between the additionality criteria – a core principle of the VCM – and the scope, mitigation methods and governance structures of EU compliance mechanisms. For these subsystems to collaborate effectively towards global climate objectives, adaptation in one or both of them may be necessary. Without such adjustments, their interaction risks producing unintended consequences that could hinder their collective progress toward broader climate goals.

5. Conclusions

Most research on the interaction between climate-related compliance instruments and the VCM has focused on projects in developing countries. This article, on the other hand, focused on a seemingly growing interest among developed countries, including EU Member States, in leveraging the VCM to support domestic climate action and advance national climate targets. While intra-EU VCM projects face challenges similar to global ones, the distinct legal context of the EU – characterized by stringent national climate targets and a strong emphasis on transparency – presents unique regulatory complexities.

The article examined the risks that intra-EU VCM projects may pose to broader climate goals if left unregulated, including the long-term mitigation objectives of the Paris Agreement. As demonstrated in the article, determining the appropriate regulatory response is complex, given the need for comprehensive understanding of both national and corporate climate target frameworks and their fundamentally different and dynamic nature. Highlighting these differences, the article showed that the integration of the fragmented, self-regulated, and rapidly evolving VCM into the structured legal framework governing EU-mandated national targets requires a broad, high-level perspective, essentially a 'bird's eye view'. For this reason, the article advocates for the use of systems thinking in regulating the VCM in Europe.

From a systems thinking perspective, achieving the objectives of the Paris Agreement requires the effective functioning of interconnected 'subfunctions' within many subsystems, including national and corporate target-based frameworks. By exploring a situation where EU Member States leverage the VCM to support their national targets, the article revealed potential misalignments between national and corporate climate target frameworks, such as those related to double claiming and non-additionality, which could undermine global climate objectives.

Based on this analysis, the article argues that systems thinking offers valuable insights into the complexities of national and corporate climate target frameworks and their interactions. It can help identify potential systemic challenges, such as conflicts and negative feedback loops, which may undermine the broader system's goals. While only two examples of such challenges were discussed in the article, many

[162] See for comparison Schneider and La Hoz Theuer who argue, in the context of Article 6 of the Paris Agreement, that the possibility to sell credits on international carbon markets 'could create incentives to set mitigation targets at unambitious levels, or to define their scope narrowly, in order to accrue more benefits from transferring units internationally'. Schneider and La Hoz Theuer (n 67) 392. See also ibid 395 and Betz et al. (n 69) 52.

[163] Belinfanti and Stout (n 135) 604.

others undoubtedly exist, where misalignments between system elements could lead to unintended consequences that risk undermining the overarching goals of the Paris Agreement.