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Certificates under EU and International Law: A Comprehensive
Analysis

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ZUSAMMENFASSUNG / ABSTRACT

Diese Arbeit untersucht die privatrechtliche Einordnung, die Finanzregulierung und die Besteuerung von Emissionszertifikaten im Rahmen des EU-Rechts und des Völkerrechts und befasst sich dabei mit Kyoto-Einheiten, Zertifikaten des EU-Emissionshandelssystems (EU-EHS), Einheiten gemäß Artikel 6 des Pariser Abkommens sowie freiwilligen Emissionszertifikaten.

Die Studie legt einen Rahmen vor, der diese Instrumente als Eigentumsrechte betrachtet. CO₂-Instrumente sind Eigentumsrechte; ihre Bestandteile – Verwendungsbereich, Übertragungsbedingungen und Gründe für das Erlöschen des Rechts – werden jedoch vollständig durch die politischen Ziele des jeweiligen Regulierungssystems definiert und begrenzt, aus dem sie stammen. Dieser Ansatz lehnt sowohl die Definition bedingungsloser Eigentumsrechte als auch die „Sui-generis“-Schule ab.

Der Handel unterliegt Finanzvorschriften, doch diese Vorschriften prägen den Markt, ohne die zugrunde liegende Unsicherheit hinsichtlich des Eigentums zu beseitigen. Während die Mehrwertsteuer harmonisiert wurde, bleiben die direkten Steuern und die Rechnungslegungssysteme fragmentiert. Es gibt kein verbindliches multilaterales Instrument, das den privatrechtlichen Charakter dieser Instrumente definiert. Die Arbeit endet mit Empfehlungen, die darauf abzielen, die Rechtssicherheit im grenzüberschreitenden Emissionshandel zu verbessern.

ABSTRACT

This thesis examines the private law classification, financial regulation, and taxation of carbon credits within the framework of EU and international law, covering Kyoto units, EU Emissions Trading System (EU ETS) allowances, units under Article 6 of the Paris Agreement, and voluntary carbon credits.

The study sets forth an instrumental-property framework. Carbon instruments are property rights; however, their components—scope of use, conditions of transfer, and grounds for the right’s termination—are entirely defined and limited by the public policy objectives of the regulatory regime from which they originate. This approach rejects both the definition of unconditional property rights and the *sui generis* school of thought.

Trade is governed by financial regulations, but these regulations shape the market without eliminating the underlying uncertainty regarding ownership. While value-added tax has been harmonized, direct taxation and accounting systems remain fragmented. There is no binding multilateral instrument defining the private law nature of these instruments. The thesis concludes with recommendations aimed at enhancing legal certainty in cross-border carbon trading.

TABLE OF ABBREVIATIONS

A6.4ER: Article 6.4 Emission Reduction

AAU: Assigned Amount Unit (Kyoto Protocol)

ACER: Agency for the Cooperation of Energy Regulators

AG: Advocate General (Court of Justice of the European Union)

BaFin: Bundesanstalt für Finanzdienstleistungsaufsicht (German Federal Financial Supervisory Authority)

BGH: Bundesgerichtshof (German Federal Court of Justice)

BNA: Bureau of National Affairs

CBAM: Carbon Border Adjustment Mechanism

CCP: Central Counterparty

CDM: Clean Development Mechanism (Kyoto Protocol)

CER: Certified Emission Reduction

CFA: CFA Institute (Chartered Financial Analyst Institute)

C-GEO: Core Global Emissions Offset (Voluntary carbon contract)

CFTC: Commodity Futures Trading Commission (United States)

CJEU / ECJ: Court of Justice of the European Union / European Court of Justice

CMA: Conference of the Parties serving as the meeting of the Parties to the Paris Agreement

CME: Chicago Mercantile Exchange

CMP: Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol

COP: Conference of the Parties (UNFCCC)

CPR: Commitment Period Reserve

CRCF: Carbon Removal Certification Framework (EU)

EAMP: Emission Allowance Market Participant

ECLI: European Case Law Identifier

EEA: European Economic Area

EEX: European Energy Exchange

EFRAG: European Financial Reporting Advisory Group

EMIR: European Market Infrastructure Regulation

EPIAŞ: Enerji Piyasaları İşletme Anonim Şirketi (Energy Exchange Istanbul)

ERPA: Emission Reduction Purchase Agreement

ERU: Emission Reduction Unit

ESMA: European Securities and Markets Authority

ETS: Emissions Trading System

ETC: Exchange Traded Commodity

ETF: Exchange-Traded Fund

EU ETS: European Union Emissions Trading System

EUA: European Union Allowance (EU Emission Allowance)

FUNAI: Fundação Nacional do Índio (Brazilian National Indian Foundation)

GATT: General Agreement on Tariffs and Trade

GEO: Global Emissions Offset (Voluntary carbon contract)

HCJP: Haut Comité Juridique de la Place Financière de Paris

IAS: International Accounting Standard

IASB: International Accounting Standards Board

ICE: Intercontinental Exchange

IFRIC: International Financial Reporting Interpretations Committee

ILO: International Labour Organization

IOSCO: International Organization of Securities Commissions

ISDA: International Swaps and Derivatives Association

ITL: International Transaction Log

ITMO: Internationally Transferred Mitigation Outcome

Ji: Joint Implementation (Kyoto Protocol)

LEI: Legal Entity Identifier

LG: Landgericht (German Regional Court)

LoA: Letter of Approval

LSE: London School of Economics and Political Science

MAR: Market Abuse Regulation

MiFID I: Markets in Financial Instruments Directive I

MiFID II: Markets in Financial Instruments Directive II

MiFIR: Markets in Financial Instruments Regulation

MSR: Market Stability Reserve

MTIC: Missing Trader Intra-Community (Fraud)

N-GEO: Nature-Based Global Emissions Offset (Voluntary carbon contract)

NCA: National Competent Authority

NDC: Nationally Determined Contribution

NFC- / NFC+: Non-Financial Counterparty (EMIR classification)

NRA: National Regulatory Authority

OECD: Organisation for Economic Co-operation and Development

OIES: Oxford Institute for Energy Studies

OJ: Official Journal of the European Union

OTC: Over-the-Counter

OUP: Oxford University Press

PACM: Paris Agreement Crediting Mechanism

REDD+: Reducing Emissions from Deforestation and Forest Degradation

REMIT: Regulation on Wholesale Energy Market Integrity and Transparency

RMU: Removal Unit (Kyoto Protocol)

SEI: Stockholm Environment Institute

TEHG: Treibhausgas-Emissionshandelsgesetz (German Greenhouse Gas Emission Trading Act)

TFEU: Treaty on the Functioning of the European Union

UK ETS: United Kingdom Emissions Trading System

UNFCCC: United Nations Framework Convention on Climate Change

UNIDROIT: International Institute for the Unification of Private Law

UNTS: United Nations Treaty Series

VAT: Value Added Tax

VCC: Voluntary Carbon Credit

VCMI: Voluntary Carbon Markets Integrity Initiative

WTO: World Trade Organization

I. INTRODUCTION

1.1. The Problem: A Trillion-Dollar Market on an Unfinished Foundation

In 2024, the global value of traded carbon allowances exceeded 800 billion euros. Trading volume, meanwhile, rose by approximately a quarter compared with the previous year, and the market continued to grow towards the projected scale of trillions of dollars.¹ Within this market, the European Union Emissions Trading System alone accounts for the overwhelming majority of the value. Since its establishment in 2005, the system has generated cumulative auction revenue in excess of 265 billion euros, and approximately 13.7 billion tonnes of carbon dioxide equivalent have been traded over the past year.² Carbon allowances are auctioned by governments and traded on regulated exchanges. Furthermore, carbon allowances can be used as underlying assets in futures and options contracts, pledged as collateral in financing arrangements, or surrendered to fulfil legal obligations. They are subject to taxation in the hands of those trading them and are the subject of cross-border transfers between jurisdictions whose systems are becoming increasingly interconnected. When examined in light of these characteristics, it must be acknowledged that carbon instruments have become one of the most significant intangible assets from an economic perspective at the start of the twenty-first century.

However, beneath this complex, rapidly expanding and large-scale structure, the most fundamental legal question remains unanswered. Under private law, what does a carbon allowance holder actually hold, and how can the legal nature of these carbon instruments be defined? If this represents a property right, what type of property right is it: a licence; a contractual right; a financial instrument; an administrative grant that can be revoked by the state; or a *sui generis* entity that does not fit into any of these categories? This is not merely an academic question. Whether an allowance can be owned, whether it can be transferred free from competing claims, whether it can be used as security, or whether it is protected in the event of an intermediary's insolvency; how its disposal is to be taxed; whether it can be recognised for

¹ In 2024 the global value of traded carbon markets exceeded EUR 800 billion, with traded volume rising by approximately 25% year-on-year: Carbon Pulse / LSEG analysts, *Global Carbon Market Review 2024* (February 2025); some analyses place the 2024 traded value as high as USD 1.5 trillion (up from approximately USD 950 billion in 2023): Refinitiv/LSEG carbon market data. By end-2025 the EU ETS alone had raised cumulative auction revenues of EUR 265.7 billion since 2005.

² International Carbon Action Partnership, *EU Emissions Trading System (EU ETS)* (ETS factsheet) — cumulative EU ETS revenue of EUR 265.7 billion to end-2025; Center for Sustainable Finance, *The State of Carbon Markets — 2025 Review* (2025) — 13.7 billion tonnes CO₂e traded in 2024 across 4.7 million transactions.

compliance in a linked foreign system; and whether the income it generates is taxed in one state or in two states — all these issues, as this thesis will demonstrate, depend on a classification that neither the EU ETS Directive, nor the financial regulatory framework, nor the international climate regime has yet provided. The market was built and made to function on the basis of a legal foundation that has never been fully established.

1.2. Historical and Institutional Context

The roots of this shortcoming lie in the history of the market itself, which was constructed to provide a rapid response to an environmental imperative rather than being designed based on established legal principles. The first steps toward this structure were taken with the 1992 United Nations Framework Convention on Climate Change and the 1997 Kyoto Protocol. The Kyoto Protocol, for the first time, established legally binding emission reduction targets for industrialised countries and created flexibility mechanisms—which led to the emergence of the first internationally tradable units—to help achieve these targets. These include Assigned Amount Units, project-based certified emission reductions, and emission reduction units.³ The European Union, which adopted the EU Emissions Trading System (EU ETS) Directive in 2003, launched the EU Emissions Trading System in 2005 as a “cap-and-trade” program for its own facilities, later linking it to the Kyoto mechanisms and subsequently to the Swiss system.⁴ The 2015 Paris Agreement has reshaped international efforts within the framework of nationally determined contributions, and in its Article 6, it envisaged a new generation of cooperative and market-based mechanisms, the operational rules for which were finally finalised at COP29 in 2024.⁵ In addition to these compliance regimes, a voluntary carbon market has emerged in which carbon credits certified by private standard-setting bodies are purchased by companies to meet their self-imposed climate commitments. Despite its recent contraction and ongoing integrity concerns, this market continues to attract significant institutional investment.

At every stage of this development, while legal and institutional efforts have focused on the framework of public law emission caps, allocation methods, monitoring and verification rules,

³ United Nations Framework Convention on Climate Change (adopted 9 May 1992, entered into force 21 March 1994) 1771 UNTS 107; Kyoto Protocol to the UNFCCC (adopted 11 December 1997, entered into force 16 February 2005) 2303 UNTS 162.

⁴ Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community [2003] OJ L275/32; European Commission, *About the EU ETS* (the system was launched in 2005).

⁵ Paris Agreement (adopted 12 December 2015, entered into force 4 November 2016) UNTS 3156, art 6; see Chapter 5.

and registration systems—the private law nature of the unit created by the system has not been addressed. This instrument is designed to be the subject of trade. The question of what constitutes a subject of trade from the perspective of private law has been treated as a matter to be resolved by national law and has never been raised. The consequences of this gap form the subject of this thesis.

1.3. Research Gap

The legal literature on carbon markets is quite extensive. However, the literature tends to address carbon instruments primarily from the perspective of a single discipline. While one group of studies examines questions related to property theory—such as whether emission allowances constitute property and, if so, what type of property they are—another group has examined their treatment as financial instruments under the 2008 financial crisis regulatory framework. Another perspective addresses the value-added tax, corporate tax, and accounting issues raised by these instruments. Yet another group of academic studies, largely situated within the fields of public international law and environmental law, analyses the climate regime and market mechanisms. Each of these perspectives and studies aims to shed light on a specific aspect of this instrument. However, they rarely interact with one another, and the connections between them—namely, how an unresolved private law foundation extends across regulatory, fiscal, and international layers—have not been systematically traced.

This thesis aims to address this gap. It argues that the topics addressed separately in the existing literature are different aspects of a single issue, and that this issue becomes apparent only when these layers are examined together. By examining private law classification, financial regulations, taxation, and the international coordination of carbon instruments within a single analytical framework, it aims to demonstrate that the fragmentation observed in each of these areas is not merely a series of independent technical challenges, but rather the repeated manifestation of a single, unresolved fundamental problem.

1.4. The Reframing: From “Legal Nature” to “Private Law Classification and Governance”

The central thesis of this thesis was originally centred on the “legal nature” of carbon credits—that is, the ontological question of what a carbon instrument essentially is. However, during the research process, the focus of this line of inquiry was reframed. The main question of the research shifted from what a carbon instrument is in the abstract to how it is regulated by private

law, financial regulations, and taxation. This reframing is not a step back from the question of legal nature, but rather a way to answer it. For the central thesis advanced here is that the legal nature of the carbon instrument cannot be expressed in abstract terms. This is because the instrument is constructed instrumentally, and its content is provided, shaped, and limited by the regulatory regime and national legal system within which it operates. To ask what the instrument is, one must determine how the applicable rules treat it. Governance is the nature itself. Consequently, the shift from “legal nature” to “private law classification and governance” is a methodological choice justified by the empirical findings of the thesis, and this choice is reflected in the framework of every subsequent chapter.

1.5. Central Argument

This thesis presents a single yet cumulative argument. Drawing on Manea’s concept of instrumental property and Yliheljo’s analysis of the variability of emissions rights ownership, the thesis argues that the carbon instrument is best understood as an instrumental property right whose components are defined by the objectives of the regulatory regime and vary depending on the context in which the right operates. Building on this foundation, the thesis argues that the absence of a harmonised private law definition leads to a layered fragmentation that extends across four successive levels. The private law layer, in which the property content of the instrument is left to different national laws; the regulatory layer, which regulates the trading of the instrument within a financial framework without resolving its property nature; the fiscal layer, where taxation is harmonised for value-added tax purposes, but which remains fragmented according to national classifications in terms of direct taxation and accounting; and the international layer, where—in the absence of any binding multilateral instrument—the Paris Agreement’s mechanisms system linkages, and border adjustments manage coordination without eliminating the fragmentation. The thesis concludes that this fragmentation is neither accidental nor irreversible. This situation stems from a deliberate choice to leave the question of the allowance’s ownership status to national law.

1.6. Research Questions and Hypotheses

The thesis is structured around four research questions derived from the research proposal and further clarified through the reframing described above:

- How are carbon credits classified under EU and international law?

- How are carbon credits regulated as financial instruments within the European Union?
- What taxation challenges and legal uncertainties do they raise within the Union?
- From the perspective of international law, what issues arise regarding the integration of carbon markets across different jurisdictions?

These questions are addressed with the aim of testing three hypotheses: that uncertainty regarding the legal classification of carbon credits hinders regulatory and tax harmonisation; that a more harmonised EU financial regulatory framework would enhance the effectiveness of carbon trading markets; and that tax coordination is vital for the efficiency and fairness of international carbon markets. In the final section, each question and each hypothesis is revisited in light of the analysis conducted.

1.7. Methodology

Using a doctrinal legal methodology, this thesis examines the primary legislation, case law, soft law, and academic sources governing carbon instruments across four levels of analysis. The doctrinal analysis is supported by a comparative element, drawing primarily on the treatment of emission allowances in certain Member States—notably Germany, France, Poland, and Belgium (with the United Kingdom included for comparative purposes)—and on the policy-analytical aspects of establishing international coordination mechanisms. The analysis draws on three tiers of source materials: primary legislation, including the EU Emissions Trading System (EU ETS) Directive, the VAT Directive, financial market regulations, the Paris Agreement, the CBAM Regulation, and various national laws; case law from the Court of Justice of the European Union and national courts; and secondary literature, including the work of UNIDROIT and IOSCO, as well as leading academic and institutional research. Where primary sources are determinative, direct references to these sources are provided; and where the meaning or current status of a development is controversial or subject to debate, the aim is to verify this by comparing it with reliable contemporary sources.

1.8. Scope and Structure

This thesis examines the main categories of carbon instruments—Kyoto units, EU emission allowances, units under Article 6 of the Paris Agreement, and voluntary carbon credits—and analyses EU and international legal frameworks by drawing comparative references to selected national systems. The aim is not to provide a comprehensive examination of each national

regime or to conduct an empirical or quantitative economic analysis of the costs of fragmentation. The thesis adopts a legal and doctrinal approach. During the analysis, the thesis goes beyond the topics previously outlined in its proposal to develop a series of additional research questions as required by the argument. These include the dependence of an owner's tax status on the owner's own characteristics; the accounting layer underlying corporate income tax; the Carbon Border Adjustment Mechanism as a deliberately designed counterexample; the role of transnational private ordering; and the validation of the thesis's framework by Türkiye's recently adopted Climate Law. These should not be viewed as deviations from the proposal's methodology, but rather as extensions of that methodology.

The thesis is structured around six main chapters. Following this introduction, Chapter 2 presents a fundamental analysis, examining the private law classification and governance of each category of carbon instrument and developing the instrumental property framework that underpins the thesis. Chapter 3 focuses on the financial regulation of carbon markets under MiFID II, EMIR, and the Market Abuse Regulation, demonstrating that the regulatory framework oversees trading without resolving the issue of ownership. Chapter 4 examines taxation and reveals that fiscal treatment varies according to national private law classifications. Chapter 5 addresses international coordination and harmonisation through the mechanisms of Article 6 of the Paris Agreement, the interconnection of trading systems, controversial border adjustments, the position of developing countries, and transnational private ordering. Chapter 6 synthesises the analysis, validates the hypotheses, answers the research questions, and aims to present the thesis's recommendations and the avenues for future research it opens up.

II. PRIVATE LAW CLASSIFICATION & GOVERNANCE OF CARBON CERTIFICATES

The legal characterisation of carbon certificates is not merely a theoretical academic exercise. Determining the legal nature of carbon certificates forms the basis of the entire regulatory, financial and taxation framework of carbon markets. Whether these certificates are classified as property rights, administrative permits or financial instruments during their transformation from international policy instruments into marketable assets is a key factor in determining the scope of legal protection, ensuring financial oversight and establishing tax liabilities. Due to their unique characteristics that do not fit into traditional legal categories, carbon certificates are generally characterised as *sui generis* instruments, which makes their status under existing legal systems considerably more complex. Without determining their legal classification, it is

impossible to achieve the concept of ‘legal certainty,’ one of the most important elements of a stable and transparent market. This section analyses the evolution of carbon certificates from their origins in international climate agreements to their current position within the legal framework of the European Union and international law, and their classification under private and public law.

2.1. Structural Evolution: From Kyoto to Paris

When determining the legal nature of carbon credits, it is crucial to analyse the Kyoto Protocol and the Paris Agreement. The Kyoto Protocol was the first international agreement to lay the foundations for carbon markets. Subsequently, the nature of carbon units underwent significant transformations, evolving from the rigid, top-down compliance mechanism under the Kyoto Protocol to the more flexible, market-oriented, bottom-up framework under the Paris Agreement.

2.1.1. The Kyoto Era: Sovereign Rights and the Non-Property Disclaimer

Under the Kyoto Protocol, three main units have been established as primary public international law instruments for primary trading. These units are: Assigned Amount Units (AAUs), Certified Emission Reductions (CERs) and Emission Reduction Units (ERUs). While AAU, CER and ERU units represent the sovereign “rights” of states to fulfil their emission limitation commitments, they carry different legal weightings with regard to private sector participation. Article 17 of the Kyoto Protocol clearly states that the Conference of the Parties shall establish the principles, methods, rules and guidelines for the verification, reporting and accountability of emissions trading.⁶ The recognition of sovereignty and authority to the Parties in emissions trading demonstrates the absolute power of the Parties in this regard. This sovereign authority demonstrates that carbon units are “creations of law” and that their existence, validity, and transferability are functional only as long as the regulatory framework established by the state remains in place. The legal nature of these units will always be linked to the sovereign discretion of the Parties based on this provision. This is one of the most important aspects that distinguishes them from traditional commodities. The legal structure of Article 17 reflects a top-down regulatory approach by setting the emission ceiling of the international agreement and providing for the allocation of these rights among sovereign states

⁶ Kyoto Protocol to the United Nations Framework Convention on Climate Change (adopted 11 December 1997, entered into force 16 February 2005) (Kyoto Protocol) art 17.

within a closed calculation system. This structure essentially ensures compliance with the international obligations under the Protocol.

2.1.2. Assigned Amount Units (AAUs):

The legal nature of Assigned Amount Units (AAUs) can, in the simplest terms, be defined as a hybrid structure situated at the intersection of public international law and national regulatory frameworks. When assessed within the framework of international law, AAUs are not recognised as conferring an absolute right of ownership. The preamble to Decision 15/CP.7, which was legitimised by Decision 2/CMP.1, explicitly states that the Kyoto Protocol does not create or confer any form of emission right, ownership or authority upon Annex I Parties.⁷ This deliberate waiver reveals the fundamental policy choice in this matter: by rejecting the emergence of property rights on the international level, the drafters sought to prevent the de facto privatisation of the atmosphere and to safeguard states' sovereign discretion to amend, cancel or reallocate these units without triggering claims for expropriation or liability for compensation under international investment law.⁸

Consequently, there is a consensus in the academic literature that AAUs should not be defined in the traditional sense as private assets, but rather as regulatory property or administrative allocations—instruments that permit a specific quantity of greenhouse gas emissions within the compliance limits set by the Protocol.⁹ In this sense, AAUs function as instruments of sovereignty compliance: their existence, validity and enforceability are entirely dependent on regulatory structures and processes established and maintained by states. They will only exist, be considered valid and be enforceable as long as states permit and regulate them. This authority, which lies entirely within the discretion of sovereignty, is one of the key factors distinguishing allowances from traditional commodities or securities and leading to their classification as *sui generis* instruments under current legal classifications.

⁷ UNFCCC, Decision 15/CP.7, 'Principles, nature and scope of the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol', Preamble, in FCCC/CP/2001/13/Add.2; confirmed as Decision 2/CMP.1, FCCC/KP/CMP/2005/8/Add.1.

⁸ Matthieu Wemaere, Charlotte Streck and Thiago Chagas, 'Legal Ownership and Nature of Kyoto Units and EU Allowances' in David Freestone and Charlotte Streck (eds), *Legal Aspects of Carbon Trading: Kyoto, Copenhagen and Beyond* (Oxford University Press 2009) 37-38, 44.

⁹ Marta Legnaioli, 'The surrender of wrongly allocated greenhouse gas emission allowances: Note to the case C-321/15 *ArcelorMittal v Luxemburg*' (2018) 20 *Environmental Law Review* 208.

The issue of transferability and transfer procedures under private law is another matter that further complicates the situation. The Kyoto Protocol, which essentially serves as a framework for transfer procedures between states, does not confer or impose direct rights and obligations on private entities.¹⁰ However, Article 17 permits Parties listed in Annex I to grant private legal entities the authority to participate in emissions trading, thereby effectively allowing states to transfer part of their sovereign right to the private sector in this regard.¹¹ This will be deemed possible provided that states have delegated the right of transfer to entities governed by private law. For this reason, the transferability of AAUs under private law is not a matter arising from the nature of this instrument, but rather a consequence of a prior delegation of sovereign authority.

As a result of such authorisations, the legal status of AAUs in transactions governed by private law will be determined exclusively in accordance with the domestic legal framework of the jurisdiction in which they are held, bought and sold.¹² In jurisdictions where domestic law permits private trading within this framework, AAUs acquire the characteristics of a quasi-property right: although they constitute special administrative authorisations that states may, in principle, revoke or amend - whilst their enforceability against the state remains limited - they are treated as private property between the parties.¹³ This dual characteristic affords private entities the ability to hold, transfer and dispose of AAUs through standard commercial contracts, and enables a distinct market to operate on the basis of traditional private law instruments regarding the transfer and conveyance of intangible assets. Consequently, the provisions governing the transfer of intangible assets subject to private law will continue to apply to AAUs.

The absence of a jurisdiction that directly determines the ownership status of AAUs is a situation of considerable legal significance that cannot be regarded as coincidental. Given that AAUs are created exclusively by an act of international law and are defined as state assets that can be transferred to specific jurisdictions through means such as national legislation or parliamentary approval,¹⁴ disputes arising from AAU transactions will fall outside the

¹⁰ Kyoto Protocol (n 6) art 17.

¹¹ *ibid.*

¹² Wemaere, Streck and Chagas (n 8) 51-52, 54.

¹³ *ibid.*

¹⁴ Wemaere, Streck and Chagas (n 8) 44.

jurisdiction of national courts and will be subject to international arbitration under the dispute settlement provisions of the UNFCCC or within the framework of bodies such as the Permanent Court of Arbitration or UNCITRAL.¹⁵ It is for this reason that the sovereign nature of AAUs, to a certain extent, hinders or even prevents the development of property law jurisprudence within the scope of domestic law.

This situation creates a significant contradiction regarding the law applicable where such carbon units—particularly EU Emission Allowances (EUAs)—are held and traded by the private sector. In the case of *Armstrong DLW GmbH v Winnington Networks Ltd*, the High Court of England and Wales explicitly classified EUAs as intangible assets that could be the subject of a claim for restitution based on a right of ownership.¹⁶ In reaching this conclusion, it applied the classic test for the existence of ownership established by the House of Lords in the case of *National Provincial Bank v Ainsworth*. According to this test, a right must be identifiable, recognisable by third parties, capable of being acquired by third parties by its very nature, and possess a degree of permanence or stability.¹⁷ Finding that EUAs met each of these conditions, the Court concluded, relying on previous case law concerning similar intangible rights—including waste management licences—that these units constitute property, regardless of their legal and regulatory origins.¹⁸

However, within the framework of European law, the Court of Justice of the European Union has deliberately refrained from imposing a uniform classification when assessing units under property law. In the case between *Arcelor Mittal Luxembourg SA and the Grand Duchy of Luxembourg (C-321/15)*, the operator argued that the compulsory surrender of incorrectly allocated emission allowances was equivalent to expropriation. The Court, however, rejected this argument and explicitly stated that the legal classification of emission allowances — whether as a property right, a financial instrument or an administrative authorisation — falls outside the scope of EU law and is entirely left to the national law of the Member States.¹⁹ This judicial respect for and elevation of national legal systems, as one of the main points of contention in this thesis, is the fundamental driving force behind the regulatory fragmentation

¹⁵ Sander Simonetti and Rutger de Witt Wijnen, ‘International Emissions Trading and Green Investment Schemes’ in Freestone and Streck (eds) (n 8) 157-75.

¹⁶ *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch).

¹⁷ *ibid* [50]-[61]; *National Provincial Bank Ltd v Ainsworth* [1965] AC 1175 (HL) 1247-48 (Lord Wilberforce).

¹⁸ *Armstrong DLW* (n 16) [50]; *In Re Celtic Extraction Ltd* [2001] Ch 475.

¹⁹ Case C-321/15 *ArcelorMittal Rodange et Schifflange SA v État du Grand-Duché de Luxembourg* ECLI:EU:C:2017:179, para [46].

characterising European and international carbon markets and the resulting unbridgeable gaps in this area.

2.1.3. Certified Emission Reductions (CERs)

Whilst AAUs represent a top-down allocation of sovereign compliance entitlements, CERs emerge from a fundamentally different generative logic. They do not arise from administrative permits granted to states under a provision of international law, but through a project-based mechanism that rewards verified emission reductions achieved in the real economy and as a result of ordinary economic activities. As Streck and von Unger point out, CERs, by their very nature and structure, do not create a right to emit greenhouse gases; rather, they constitute a reward system for reducing emissions. In other words, unlike other allocation schemes that grant emission rights, they serve an incentive purpose.²⁰ This distinction has direct implications for classification under private law and for contracts relating to commercial activities.

Under the Clean Development Mechanism (CDM), CERs are generated through private or public investments in emission reduction projects carried out in developing countries not included in Annex I, as established by Article 12 of the Kyoto Protocol. At the international level, the declaration regarding the denial of property rights governing AAUs remains valid for CERs: the Kyoto Protocol does not confer any absolute rights, titles or authority in relation to emissions.²¹ Accordingly, CERs will function as regulatory accounting units under international law. From a practical perspective, another important distinction concerns the eligibility of CERs under the EU Emissions Trading Scheme (EU ETS). The EU Linkage Directive permits Member States to allow private operators to import and surrender CERs to fulfil their compliance obligations under the EU ETS, provided they are subject to certain quantitative and qualitative restrictions.²² In contrast, AAUs continue to emphasise their sovereign nature by being excluded from use by private entities for EU ETS compliance purposes.

²⁰ Charlotte Streck and Moritz von Unger, 'Creating, Regulating and Allocating Rights to Offset and Pollute: Carbon Rights in Practice' (2016) 10 Carbon and Climate Law Review 186.

²¹ UNFCCC, Decision 15/CP.7, 'Principles, nature and scope of the mechanisms pursuant to Articles 6, 12 and 17 of the Kyoto Protocol', FCCC/CP/2001/13/Add.2 (10 November 2001) Preamble; confirmed as UNFCCC, Decision 2/CMP.1, FCCC/KP/CMP/2005/8/Add.1 (n 7).

²² European Parliament and Council Directive 2004/101/EC of 27 October 2004 amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanisms [2004] OJ L338/18 (Linking Directive).

The entry of CERs into the private sector is subject to the issuance of a Letter of Approval (LoA) by the Host Country's Competent National Authority. This document has a dual legal nature. Whilst serving both as an administrative authorisation under domestic law and as a unilateral declaration under public international law, it transfers the authority to hold, own and transfer the resulting credits to the private sector project developer.²³ In some jurisdictions — most notably China — the issuance of a LoA explicitly recognises the private sector's right to transfer CERs and to benefit directly from the resulting revenues.²⁴

Once CERs have been issued by the CDM Executive Board and transferred to special registry accounts, their legal status will be determined by the domestic private law of the jurisdiction in which they were issued. This situation leads to significant fragmentation regarding the coherence of legal systems. In the United Kingdom, as discussed above, the analysis conducted by the High Court in the case of *Armstrong DLW GmbH v Winnington Networks Ltd* remains equally applicable to CERs. As Jolene Lin argues, CERs exist within a defined legal framework, can be uniquely identified, and possess commercial value due to their transferability, thereby meeting the legal requirements for property classification.²⁵ Similarly, the Finnish legal system classifies such units as intangible assets, akin to patents and other intellectual property rights.²⁶ At the civil law level, France's *Haut Comité Juridique de la Place Financière de Paris* (HCJP) has officially classified CERs as movable assets that materialise solely through an entry in the European registry.²⁷ In contrast, while Sweden has historically treated allowances as financial instruments subject to financial services regulations, Austria—along with Germany, France, Italy, Poland, Portugal, and Spain—classifies them as goods subject to trade.²⁸ Romania's securities market regulator has similarly adopted the financial instrument classification, partly with the aim of reducing the risk of VAT carousel fraud.²⁹

²³ Wemaere, Streck and Chagas (n 8) 43.

²⁴ Christopher Tung, 'Carbon Law and Practice in China' in David Freestone and Charlotte Streck (eds), *Legal Aspects of Carbon Trading: Kyoto, Copenhagen and Beyond* (Oxford University Press 2009) 505.

²⁵ Jolene Lin, 'Private Actors in International and Domestic Emissions Trading Schemes' in David Freestone and Charlotte Streck (eds), *Legal Aspects of Carbon Trading: Kyoto, Copenhagen and Beyond* (Oxford University Press 2009) 142.

²⁶ Krzysztof Gorzelak, 'The legal nature of emission allowances following the creation of a Union Registry and adoption of MiFID II — Are they transferable securities now?' (2014) 9 *Capital Markets Law Journal* 374-75.

²⁷ Haut Comité Juridique de la Place Financière de Paris, *Report on the Legal and Regulatory Aspects of Voluntary Carbon Credits* (HCJP, 16 October 2024) 18.

²⁸ Wemaere, Streck and Chagas (n 8) 50.

²⁹ Gorzelak (n 26) 375.

Despite the fragmentation in this field, efforts have been made in the academic literature to develop a consistent analytical framework for evaluating the ownership dimensions of CERs. Drawing on the civil law tradition, Wemaere, Streck, and Chagas applied the classical triad of *usus*, *fructus*, and *abusus* to carbon units and concluded that the owners of these units effectively exercise property-like rights: the right to use the unit for compliance (*usus*), to derive economic benefit from its transfer (*fructus*), and to dispose of it through delivery or cancellation (*abusus*).³⁰ This functional analysis supports the characterisation of CERs as quasi-property rights under private law, even though judicial authorities have not explicitly granted this status through legislative decisions. Mace, in a complementary manner, argues that the actual physical reduction in emission volumes constitutes a strong and sufficient basis, within the scope of private contracts, to secure the legal property right regarding future potential rights arising from the relevant activity;³¹ this perspective grounds the transferability of CERs under private law not in any official regulatory grant, but in the factual reality underlying the emission reduction.

2.1.4. Emission Reduction Units (ERUs)

Emission Reduction Units (ERUs) created under the Joint Implementation (JI) mechanism in accordance with Article 6 of the Kyoto Protocol occupy a structurally distinct and unique position within the Kyoto Protocol system. Unlike CERs, which arise from investments in developing countries excluded from Annex I and in environments without emission limits, ERUs are generated in Annex I countries that are currently operating under binding emission caps. In the academic literature, ERUs are characterised as having a hybrid structure between allowances and emission credits. They are neither purely sovereign compliance instruments nor independent project-based credits. However, they are units obtained through the cancellation of an equivalent amount against the host country's allowances to prevent double counting.³²

Since the host country already has a fixed national AAU budget, the creation of an ERU cannot generate new international emission rights. When a specific JI project achieves verified emission reductions, the host country government is obligated to convert its sovereign AAUs—or Removal Unit (RMUs)—into ERUs and transfer them to the private investor's registry account.³³ As Hopley and Roberts also note, host countries have an obligation to transfer one

³⁰ Wemaere, Streck and Chagas (n 8) 36-37, 48.

³¹ MJ Mace, 'The Legal Nature of Emission Reductions and EU Allowances: Issues Addressed in an International Workshop' (2005) 2 Environmental Law Review 124.

³² Wemaere, Streck and Chagas (n 8) 43.

³³ *ibid* 43.

AAU for every ERU created. This transforms JI into a self-regulatory mechanism requiring far greater national oversight than the CDM.³⁴ This conversion process constitutes a significant legal transformation under private law. A sovereign compliance instrument is transformed into a project-based unit transferred to the private sector through a unilateral action by the host government. In this way, the state effectively relinquishes a portion of its sovereign wealth and transfers it to the private sector.

The implications of this structural design under private law are quite far-reaching. Although the Letter of Approval (LoA) issued by the host country grants a private-sector developer the authority to participate in a JI project, it provides significantly less legal certainty and clarity compared to its counterpart under the CDM. Under the CDM, once the host country's approval has been obtained, the authority to issue CERs is exercised by a single international body, the CDM Executive Board. Buyers retain the right to request that units be delivered directly to their own accounts.³⁵ In contrast, under JI, the approval and registration of projects, as well as the actual conversion and issuance of ERUs, are exclusively subject to the host country's domestic law.³⁶ The LoA does not directly grant the buyer the right to delivery; the host country retains absolute control over delivery.³⁷ Consequently, ERUs can effectively be characterised as AAUs permitted for private trade, and JI is as vulnerable to the operations of the host country's domestic institutions and political will as it is under the CDM.³⁸

This institutional vulnerability manifests itself in various legal risk categories for private parties. First, in the event of a change in the host country's political or economic conditions—for example, if the host government deems it more advantageous to sell surplus AAUs directly through international emissions trading rather than issuing ERUs to private developers—a government delivery risk may arise due to the possibility of ERU issuance being delayed or suspended.³⁹ Second, from a more technical perspective, the cross-border transfer of ERUs may depend on the host country's compliance with international trade regulations and its ability to

³⁴ Anthony Hobley and Carly Roberts, 'Joint Implementation Transactions: An Overview' in David Freestone and Charlotte Streck (eds), *Legal Aspects of Carbon Trading: Kyoto, Copenhagen and Beyond* (Oxford University Press 2009) 200-01.

³⁵ Wemaere, Streck and Chagas (n 8) 43.

³⁶ Hobley and Roberts (n 34) 200-01.

³⁷ *ibid.*

³⁸ Jelmer Hoogzaad and Charlotte Streck, 'A Mechanism with a Bright Future: Joint Implementation' in David Freestone and Charlotte Streck (eds), *Legal Aspects of Carbon Trading: Kyoto, Copenhagen and Beyond* (Oxford University Press 2009) 183.

³⁹ Hobley and Roberts (n 34) 200-01.

maintain the Commitment Period Reserve (CPR). This is because Kyoto rules require countries to maintain at least ninety percent of the allocated amount in their national registry at all times.⁴⁰ When the host country's registry balance falls below this threshold, the International Transaction Log (ITL) will automatically block transfers, and the rights of private entities will be infringed upon for reasons entirely beyond their control.⁴¹ Third, in many host countries, the legal status of ERUs is not explicitly regulated under domestic law. This situation creates deep and serious uncertainty regarding ownership, taxation, and transferability, significantly weakening the buyer's private law title.⁴²

As a result of this high-risk profile, primary JI Emission Reduction Purchase Agreements (ERPAs) adopt delivery structures that are virtually uncertain or unsecured. Under these structures, sellers do not commit to paying compensation if delivery does not occur.⁴³ This contractual practice reflects the general understanding that the ERU holder's private law title is of a two-way conditional nature. This status is contingent, first, on the host state's administrative decision to carry out the conversion process, and second, on the host country's continued compliance with its international obligations under the Kyoto Protocol. Consequently, the ERU thus represents the most legally precarious of the three Kyoto units examined in this section — a private right whose existence, transferability, and enforceability remain hostage to sovereign discretion at every stage of its lifecycle.

2.1.5. The Legal Bridge: From Kyoto Units to EU Allowances

The relationship between Kyoto Protocol units and EU Emission Allowances (EUAs) under the EU Emissions Trading System (EU ETS) is not merely a matter of policy coordination, but a structural legal interdependence. Whether AAU, CER, ERU, or EUA, each unit represents the right to emit one metric ton of carbon dioxide equivalent, establishing a fundamental equivalence that forms the basis for legal fungibility between international and regional carbon markets.⁴⁴ This ensures global equivalence of units.

⁴⁰ Sander Simonetti and Rutger de Witt Wijnen, 'International Emissions Trading and Green Investment Schemes' in Freestone and Streck (eds) (n 8) 162-63.

⁴¹ *ibid* 172.

⁴² Hobley and Roberts (n 34) 202.

⁴³ *ibid* 204.

⁴⁴ A Denny Ellerman, Frank J Convery and Christian de Perthuis, *Pricing Carbon: The European Union Emissions Trading Scheme* (Cambridge University Press 2010) 49.

To ensure that the private trading of EU Emission Allowances accurately reflects the public obligations of Member States under the Kyoto Protocol, the EU has established a direct legal link between EU Emission Allowances and AAUs. The issuance of EUAs was carried out by converting an equal amount of AAUs and adding a unique identification code specific to the EUA. Subsequently, every transfer of an EUA was accompanied by a corresponding transfer of an AAU within the registry system.⁴⁵ By linking EUAs to AAUs in this manner, the EU effectively privatised a portion of each Member State's Kyoto compliance burden and transformed sovereign international obligations into instruments that could be held, transferred, and enforced under domestic private law.

The Linkage Directive (2004/101/EC) deepened this integration by establishing a formal legal link between the EU ETS and the Kyoto flexible mechanisms, enabling European installations to import and surrender CERs and ERUs to meet their EU ETS compliance obligations.⁴⁶ This regulation has made the EU ETS the primary source of global demand for CERs and ERUs and positioned the EUA price as the reference price for the global carbon market.⁴⁷ However, this link and fungibility between regional EU allowances and international Kyoto credits has not been followed by any harmonisation in the private law treatment of these instruments. Even though Kyoto units are established under public international law, their legal status in private transactions—whether as property, commodities, or financial instruments—is almost entirely dependent on the domestic law of the relevant jurisdiction where they are created, held, or traded.⁴⁸

This dependency on jurisdictional authority inevitably has direct and significant implications for commercial contracts. Since EU Emissions Trading Allowances (EUAs) and secondary CERs and ERUs are held in registry accounts and possess standard characteristics, their trading was based on highly simplified contract documents. Negotiations, however, focused primarily on commercial issues such as price and volume rather than project-specific risks.⁴⁹ At the same time, quantitative restrictions on the use of CERs and ERUs for EU ETS compliance created a price differential between the more limited Kyoto credits and EUAs, which led to the

⁴⁵ Markus Pohlmann, 'The European Union Emissions Trading Scheme' in David Freestone and Charlotte Streck (eds), *Legal Aspects of Carbon Trading: Kyoto, Copenhagen and Beyond* (Oxford University Press 2009) 360.

⁴⁶ Linking Directive (n 22).

⁴⁷ Ellerman, Convery and de Perthuis (n 44) 25, 274.

⁴⁸ Martijn Wilder and Louisa Fitz-Gerald, 'Carbon Contracting' in Freestone and Streck (eds) (n 8) 301.

⁴⁹ *ibid* 298.

emergence of specially structured financial products. In particular, through CER swaps, compliance buyers were able to profit from the price difference by selling their freely allocated EUAs and purchasing cheaper secondary CERs.⁵⁰ These developments demonstrate how the legal bridge established by the Linkage Directive expanded the private law framework for carbon instruments and deepened the fragmentation in the legal treatment of these instruments across different jurisdictions. As will be seen in subsequent sections, this tension has intensified further during the Paris Agreement era.

2.2. EU Emission Allowances (EUAs) under the EU ETS

The legal nature of EU Emission Allowances (EUAs) occupies a contradictory position at the heart of European carbon market regulations. Despite being the most widely traded and voluminous carbon instrument globally, EUAs still lack a single, uniform classification under private law at the EU level. This gap is not accidental; it is the result of a deliberate legislative choice based on the principle of shared competence.

2.2.1. The Definitional Gap and the Principle of Shared Competence

The EU Emissions Trading System (EU ETS) is a framework launched in 2005 that is currently in its fourth trading period (2021-2030) and operates according to the “cap-and-trade” principle.⁵¹ The system sets a cap on the total amount of greenhouse gases that covered facilities and companies can emit; this cap is reduced annually in line with the EU’s climate targets. Within this framework, EU Emission Allowances (EUAs) are sold through auctions or allocated for free. Operators can also trade these allowances among themselves. Those who reduce their emissions below their allocated amount can sell their surplus allowances, while those who exceed their allocation must purchase additional units. This helps to avoid significant financial penalties.⁵² As of 2023, the EU ETS has reduced emissions in covered sectors by 47% compared to 2005 levels, earning its status as the largest carbon market and becoming the most important and central tool of EU climate policy.⁵³

⁵⁰ Ellerman, Convery and de Perthuis (n 44) 274.

⁵¹ European Commission, 'About the EU ETS' (Climate Action, European Commission) <https://climate.ec.europa.eu/eu-action/carbon-markets/about-eu-ets_en> accessed 27 April 2026.

⁵² *ibid.*

⁵³ *ibid.*

The EU Emissions Trading Scheme Directive (2003/87/EC) defines an emission allowance strictly in terms of its functional purpose:

- an authorisation permitting the emission of one ton of carbon dioxide equivalent within a specified period,
- valid solely for compliance purposes under the Directive,
- and transferable in accordance with the provisions of the Directive.⁵⁴

It is noteworthy that this definition explicitly avoids characterising the emission allowance as a property right, a financial instrument, or an administrative permit. This omission was left intentionally as a result of a deliberate policy decision. During the Directive's drafting process, the European Commission proposed classifying the allowances as administrative permits, similar to the U.S. Acid Rain Program. However, this approach was rejected by the Commission's Legal Service on the grounds that it would violate the principle of authority transfer and interfere with Member States' national property and private law systems.⁵⁵ This resulting definitional gap has persisted throughout the amendments made to the Directive. This includes the Phase IV reform introduced by Directive 2018/410, which strengthened the Market Stability Reserve mechanism but failed to establish EU-wide harmonisation regarding the private law nature of EUAs.⁵⁶

As Low and Lin have also pointed out, this shortcoming constitutes one of the most significant failures of the EU Emissions Trading System (EU ETS). The reason for this situation is not merely a concession to the principle of delegation of authority, but also a failure to adequately grasp the legal nature of intangible assets. Furthermore, a misunderstanding of how rights registration systems operate is also a contributing factor.⁵⁷ According to this view, the EU ETS is a structure that harbours disadvantages due to conceptual shortcomings that force market participants to deal with unnecessary uncertainties. To overcome this disadvantageous

⁵⁴ European Parliament and Council Directive 2003/87/EC of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community [2003] OJ L275/32 (EU ETS Directive) art 3(a).

⁵⁵ Milieu Ltd, Ecologic and Klimapolitika, *Legal Nature of EU ETS Allowances* (Final Report commissioned by the European Commission, Publications Office of the European Union 2019) 70-73.

⁵⁶ European Parliament and Council Directive 2018/410/EU of 14 March 2018 amending Directive 2003/87/EC [2018] OJ L76/3.

⁵⁷ Kelvin FK Low and Jolene Lin, 'Carbon Credits as EU Like It: Property, Immunity, TragiCO2medy?' (2015) 27(3) *Journal of Environmental Law* 377, 377.

situation, it could be argued that legal clarity requires the rules of the Union Registry, which permit corrections, to be harmonised within the framework of EU law.⁵⁸

2.2.2. The Registry Regulation and the MiFID II Classification

Subsequent regulatory documents have not resolved this ambiguity but have instead deepened and further complicated it. The Union Registry Regulations—most recently the Delegated Regulation (EU) 2019/1122—state that an entry in the Union Registry constitutes *prima facie* evidence of ownership of an allowance.⁵⁹ However, the same regulation explicitly states that this provision does not harmonise the ownership of emission allowances under national law.⁶⁰ For this reason, while the Registry serves as proof of ownership at the EU level, matters concerning transferability, mortgageability, and ownership in insolvency proceedings are exclusively governed by the domestic law of each Member State, as the EUA is used as an intangible, fungible, and book-entry instrument. As Gorzelak argues, the centralised registry structure and the irreversibility of recorded transactions provide strong grounds for classifying EUAs as intangible, transferable, and registered securities under continental legal theories, despite the absence of an explicit legal definition.⁶¹

The Markets in Financial Instruments Directive II (MiFID II) classifies emission allowances as financial instruments in accordance with Annex I, Section C, Article 11.⁶² This classification serves the purposes of financial market supervision and, together with the Market Abuse Regulation⁶³, brings spot trading platforms within the scope of regulated trading venues.⁶⁴ However, this description and classification do not resolve the fundamental issues regarding the private law nature of emission allowances. According to Gorzelak, the purpose of including EUAs within the scope of MiFID II is not so much to produce a legal status outcome as it is to ensure that these markets are subject to financial regulatory oversight; furthermore, EUAs remain structurally incompatible with the multi-layered ownership systems typical of

⁵⁸ *ibid.*

⁵⁹ Commission Delegated Regulation (EU) 2019/1122 of 12 March 2019 supplementing Directive 2003/87/EC [2019] OJ L177/3, recital 4.

⁶⁰ *ibid.*

⁶¹ Gorzelak (n 26) 373-87.

⁶² Directive 2014/65/EU of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments [2014] OJ L173/349 (MiFID II), Annex I, Section C, point 11.

⁶³ Regulation (EU) No 596/2014 of the European Parliament and of the Council of 16 April 2014 on market abuse [2014] OJ L173/1 (MAR).

⁶⁴ *Milieu Ltd, Ecologic and Klimapolitika* (n 55) 24, 129.

securities.⁶⁵ Annunziata similarly notes that, whilst the MiFID II classification strengthens market supervision, it does not address the nature of EUAs within the general framework of private law with greater precision, leaving the instrument's actual ownership status to fragmented national laws.⁶⁶ The practical implications of the MiFID II classification — authorisation requirements, transparency and reporting obligations, supervisory architecture and sanctions for market abuse — are examined in detail in Chapter 3 of this thesis. For the purposes of this discussion, it should be noted that, rather than resolving the fundamental private law uncertainty surrounding the MiFID II classification, it has added yet another layer of regulatory complexity.

As Wemaere, Streck and Chagas have also pointed out, the EUA should be understood as a unique regulatory right whose function varies depending on the legal context in which it is examined. It is simultaneously a transferable licence, an administrative public right, an intangible asset and a financial instrument. It should be classified as a complex and hybrid instrument that resists being confined to a single pre-existing legal category.⁶⁷

2.2.3. Theoretical Frameworks for Understanding EUA Ownership

The fragmentation of the legal nature of EUAs has led to the development of analytical frameworks specifically designed to elucidate the structural characteristics of carbon allowance ownership. These two frameworks, proposed by Ylihjeljo and Manea respectively, offer the most comprehensive theoretical explanations currently available in literature.

Ylihjeljo's thesis on the 'variable legal status' views ownership not as a singular right, but as a dynamic legal status whose elements vary across three distinct dimensions.⁶⁸ In the personal dimension, the legal status of an EUA holder varies depending on whether the holder is a regulated facility operator subject to compliance obligations under the EU Emissions Trading System (EU ETS), or an unregulated financial participant trading in EUAs for investment or brokerage purposes. These two categories of ownership confer significantly different rights and give rise to different obligations under EU law. Consequently, the nature of ownership cannot

⁶⁵ Gorzelak (n 26) 373, 376-77, 383-85.

⁶⁶ Filippo Annunziata, 'Capital Markets Legislation and Emission Allowances: A Fruitful Marriage?' in Danny Busch, Guido Ferrarini and Seraina Grünwald (eds), *Sustainable Finance in Europe* (2nd edn, Palgrave Macmillan 2024) 699-700.

⁶⁷ Wemaere, Streck and Chagas (n 8) 36-38.

⁶⁸ Emilie Ylihjeljo, 'The Variable Nature of Ownership of Emission Units in the Intersection of Climate Law, Property Law, and the Regulation of Financial Markets' (2021) 11 *Climate Law* 51, 61.

be determined without reference to the identity of the holder.⁶⁹ In the temporal dimension—another key aspect—the legal status is determined in a time-dependent and variable manner, reflecting policy developments, changes in trading periods, the introduction of new regulatory tools such as the Market Stability Reserve, and shifts within the broader climate policy framework. As Yliheljo also notes, variability over time is inherent in the nature of ownership. Consequently, the rights attached to an EUA issued in Phase III are not the same as those attached to an EUA issued in Phase IV.⁷⁰ In the spatial dimension, the absence of harmonised property law across the EU means that the legal position of an EUA holder fluctuates as the dematerialised unit crosses borders between Member State accounts, with ownership rights determined by reference to the law of the administering Member State under Article 11(5) of Registry Regulation 389/2013.⁷¹

This three-pronged framework demonstrates that neither the classification of ownership nor the classification of administrative authorisations can fully explain the legal nature of the EUA, thereby supporting the general thesis of this chapter. Carbon instruments can best be understood as unique assets whose legal content is dynamically shaped through the interaction of EU public law, the private law of Member States and financial market regulations.

Manea, meanwhile, has developed a complementary analytical framework on this subject. Manea's doctoral thesis puts forward the concept of 'instrumental property'. This category addresses the distinctive characteristics of property rights that are deliberately created by regulators to serve specific public policy objectives, as opposed to those that arise organically from the recognition of pre-existing rights.⁷² The fundamental theoretical basis of instrumental property is that this right is entirely defined by the regulatory regime's public policy objectives and the specific context in which the rights operate.⁷³ When applied to EUAs, this implies that the property right must necessarily be balanced against external public or private interests deemed worthy of protection by the law, in order to ensure the environmental success of the EU ETS. As Manea demonstrates, certain restrictions imposed on EUAs call into question the validity of classifying emission rights generally as private property. Instead, a distinct category

⁶⁹ *ibid* 61.

⁷⁰ *ibid* 61-62.

⁷¹ *ibid* 61, 70; Commission Regulation (EU) No 389/2013 of 2 May 2013 establishing a Union Registry [2013] OJ L122/1, art 11(5).

⁷² Sabina Manea, *Instrumentalising Property: An Analysis of Rights in the EU Emissions Trading System* (PhD thesis, London School of Economics 2013) 3.

⁷³ *ibid*.

with a series of unique characteristics shaped by regulators is emerging.⁷⁴ This conclusion has been reached through comparison with legally established regimes of similar rights — intellectual property rights, EU milk quotas and spectrum licences. Each of these, like EUAs, possesses legal characteristics shaped by regulators that vary according to the specific context in which they operate.⁷⁵

2.2.4. Jurisdictional Fragmentation across Member States

The fragmentation at the national level resulting from this legal uncertainty is quite evident. In the United Kingdom, as noted in the case of *Armstrong DLW GmbH v Winnington Networks Ltd*, EUAs are identifiable, transferable, and have commercial value. For this reason, they are classified as intangible assets under common law.⁷⁶ While Finland classifies EUAs as intangible assets similar to patents, Germany's Greenhouse Gas Emission Trading Act (TEHG) explicitly states that EUAs are not financial instruments under the Banking Act and treats them as tangible assets or inventory for accounting purposes.⁷⁷ The practical implications of this distinction are most evident in the context of security interests: while France and Poland permit the mortgaging and use of EUAs as collateral, German and Belgian law do not support their use as securities, and Dutch law explicitly prohibits their pledging.⁷⁸

This fragmentation also extends to the EU financial collateral framework. Despite the classification of financial instruments under MiFID II, EUAs fall outside the scope of the Financial Collateral Directive (2002/47/EC), where the definition of a financial instrument is even narrower and emission allowances are excluded.⁷⁹ Consequently, the creation, validity, and cross-border enforceability of security rights over EUAs are determined entirely by national private law regimes. This situation creates significant legal uncertainty regarding the priority of conflicting security rights in cross-border transactions.⁸⁰ The only exception on the EU level arises in the context of clearing and settlement systems linked to official auction platforms.

⁷⁴ *ibid* 55.

⁷⁵ *ibid* 3, 53.

⁷⁶ *Armstrong DLW GmbH v Winnington Networks Ltd* (n 16) [47]-[53].

⁷⁷ Gorzelak (n 26) 374-75.

⁷⁸ Milieu Ltd, Ecologic and Klimapolitika (n 55) 70-73.

⁷⁹ Ylheljo (n 68) 62.

⁸⁰ *ibid* 63.

Permits held in a tender security deposit account are strictly considered security interests under the Settlement Finality Directive (98/26/EC).⁸¹

As documented by Streck and von Unger, Member States have made extensive use of their legislative discretion in this area, resulting in a range of different definitions—from the United Kingdom’s approach based on property law to Hungary’s treatment of EUAs as an exclusive right of the Treasury and Germany’s characterisation of them as subjective public law rights. This divergence has not been resolved even when the Registration Regulation was updated by the EU legislative body with the aim of protecting bona fide purchasers.⁸²

The practical significance of this fragmentation of jurisdiction is particularly striking in Low and Lin’s analysis of the *Armstrong v Winnington* case. The case has become extremely complex because the EU Emissions Trading Scheme (EU ETS) forces courts to rely on fragmented national laws, and the case only narrowly avoided conflicts of law arising from the German origin of the stolen EUAs. Had these issues materialised, they would have led to a level of uncertainty for market participants that the current EU regulatory framework was entirely unprepared to address.⁸³

The practical significance of this fragmentation of jurisdiction has become even more apparent with the recent initiative to link the EU and UK ETS schemes. On 19 May 2025, the European Commission and the UK Government agreed, under the ‘Joint Agreement on a Renewed Cooperation Agenda’, to work towards linking the EU ETS with the UK ETS; formal negotiations were approved by the EU Council on 13 November 2025 and commenced in January 2026. The proposed linkage agreement will require the UK’s ETS linkage to ensure dynamic alignment with EU rules supporting its operation. This development stands in direct contrast to the principle of conferral of powers, which underpins the delegation of authority to leave the legal classification of EUAs to the discretion of Member States, and, if implemented, would significantly alter the legal situation analysed in this section.⁸⁴

⁸¹ *ibid* 62.

⁸² Streck and von Unger (n 20) 185-86.

⁸³ Low and Lin (n 57) 395-96.

⁸⁴ European Commission and UK Government, *A Renewed Agenda for European Union — United Kingdom Cooperation: Common Understanding* (19 May 2025) paras 34-45; Council of the European Union, Decision authorising the opening of negotiations with the United Kingdom on the linking of emissions trading systems (13 November 2025).

2.2.5. Regulatory Intervention as a Feature of EUA Ownership

The EU Emissions Trading System (EU ETS) is not a static regulatory framework. The system has been subject to repeated and significant interventions, including the 2014 deferral decision, the establishment of the Market Stability Reserve in 2019, and the cap reductions in Phase IV. Each of these interventions has altered the supply of emission allowances and, consequently, the economic value and legal nature of the allowances held by market participants.

As Ylihjeljo also points out, the EU's proactive management of this system implies that regulatory intervention and risk have become integral features of the ownership of allowances. Consequently, the ownership of EUAs constitutes a legal status that varies over time, and its content is never absolute. On the contrary, it may be subject to constant modification in order to achieve public climate targets.⁸⁵ Milieu Ltd's research has highlighted the most serious consequence of this dynamic from a private law perspective. The MSR's authority to permanently invalidate allowances exceeding the previous year's auction volume implies that, despite the fact that over 2 billion allowances could lose their validity as a result of this mechanism, the rules governing the MSR do not recognise any property rights.⁸⁶ This regulatory power to eliminate private property interests without paying compensation — or at least without acknowledging that property rights are at stake — is a defining structural feature that distinguishes the EUA from almost all other forms of intangible property recognised in national legal systems.

2.2.6. Judicial Restraint and the *ArcelorMittal* Doctrine

At the judicial level, the Court of Justice of the European Union (CJEU) and its Advocates General have approached EUAs with considerable caution. In the case of *Borealis Polyolefine GmbH and Others* (Joined Cases C-191/14 and others), Advocate General Kokott stated that the preliminary calculation of free allocations made by a Member State does not create an established legal situation requiring protection of property under Article 17 of the Charter of Fundamental Rights of the European Union, as such protection requires a legally recognised asset value rather than a mere expectation.⁸⁷ In the criminal case against *A and B* (Case C-453/15), Advocate General Wathelet characterised VAT-related allowances as intangible

⁸⁵ Ylihjeljo (n 68) 45-46, 51.

⁸⁶ Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 167.

⁸⁷ Opinion of AG Kokott in Joined Cases C-191/14, C-192/14, C-295/14, C-389/14 and C-391/14 to C-393/14 *Borealis Polyolefine GmbH and Others* ECLI:EU:C:2015:754, para 162.

personal property to which a regulated property right is attached.⁸⁸ However, at the EU level, the Court has consistently refused to impose a uniform private law classification and, in the *ArcelorMittal* case (C-321/15), confirmed that this issue falls entirely within the jurisdiction of national legal systems.⁸⁹

The deeper legal significance of the *ArcelorMittal* case lies in what the Court did not decide. The classification of EUAs under private law has clearly been left to the discretion of the Member States, thereby confirming that the EU has no legislative competence to harmonise property law in this area. As Legnaioli also noted, neither the Court nor Advocate General Sánchez-Bordona has taken a position or issued a ruling on whether EUAs should be classified as a property right or an administrative authorisation. The judgment merely held that an allocation granted to a facility in breach of the Directive can no longer be classified as an allocation within the meaning of the Directive and may therefore be revoked.⁹⁰ This reserved stance reflects the broader constitutional framework of the EU Treaties, which, pursuant to Article 345 TFEU, safeguards Member States' sovereignty in matters of property law; it also explains why, despite the integrated nature of the EU ETS, the treatment of EUAs under private law remains a matter of profound jurisdictional fragmentation.

Yliheljo addresses this structural uncertainty through the concept of “variable legal status”. EUA ownership encompasses personal, temporal, and spatial dimensions. Since EUAs stem from transnational public climate policy, regulatory uncertainty and the inability to establish continuous cross-border security rights are inherent characteristics of the system.⁹¹ This analytical framework reinforces the main thesis of this thesis. The failure to harmonise the private law nature of carbon instruments at the EU level is not merely a technical gap but a structural feature of the regulatory architecture that leads to systematic fragmentation across financial regulation, taxation, and cross-border markets.

⁸⁸ Opinion of AG Wathelet in Case C-453/15 *Criminal proceedings against A and B* ECLI:EU:C:2016:639, para 50.

⁸⁹ Case C-321/15 *ArcelorMittal* (n 19) para [46].

⁹⁰ Marta Legnaioli, 'ArcelorMittal: The Luxembourg Reference on the Allocation of Emission Allowances' (2017) 14 Environmental Law Review 35, 36.

⁹¹ Yliheljo (n 68) 68-75.

2.3. The Paris Agreement Era: From Sovereign Units to Fragmented Governance

2.3.1. The Paris Agreement: Legal Architecture and Article 6 Market Mechanisms

The adoption of the Paris Agreement at COP21 in December 2015 produced a fundamental shift in international climate governance, with far-reaching consequences for the legal nature of carbon instruments and their treatment under private law. While the Kyoto Protocol imposed binding quantitative emission reduction obligations on Annex I countries in a strict, top-down manner, the Paris Agreement has established a hybrid legal framework that combines both top-down and bottom-up elements, allowing for much greater diversity in policy actions among the Parties.⁹² The bottom-up dimension is based on National Determined Contributions (NDCs). Through these commitments, each Party is obligated to prepare, submit, and maintain the NDCs it aims to achieve. Accordingly, it implements mitigation measures at the national level.⁹³ To prevent targets from stagnating or declining, the Paris Agreement includes a dynamic scaling-up mechanism. Each successive NDC must represent progress and improvement over the previous one, reflecting collective progress.⁹⁴ In contrast, the top-down dimension involves the existence of legally binding procedural obligations universally applicable to all Parties. These can be summarised as requirements for monitoring, reporting, and transparency.⁹⁵

This structural shift has profound implications for the legal characterisation of carbon instruments under private law. As Verde and Borghesi have noted, the Paris Agreement differs fundamentally from the Kyoto Protocol in that it establishes that each country's contribution to collective climate efforts is determined unilaterally rather than through negotiated burden-sharing; for NDCs are not legally binding emission caps, but rather voluntary or formal commitments.⁹⁶ As a result, the management of international carbon markets is no longer tied to standardised units based on a single centralised regulatory framework. Instead, it is highly fragmented across bilateral agreements, competing national regulatory regimes, and private certification standards. This fragmentation creates systematic uncertainty for private-sector actors seeking to acquire and rely on carbon credits.

⁹² Jos Delbeke, Artur Runge-Metzger, Yvon Slingenberg and Jake Werksman, 'The Paris Agreement' in Jos Delbeke and Peter Vis (eds), *Towards a Climate-Neutral Europe: Curbing the Trend* (Routledge 2019) 32.

⁹³ Paris Agreement (n 5) art 4(2).

⁹⁴ Delbeke, Runge-Metzger, Slingenberg and Werksman (n 92) 34.

⁹⁵ Stefano F Verde and Simone Borghesi, 'The International Dimension of the EU Emissions Trading System: Bringing the Pieces Together' (2022) 83 *Environmental and Resource Economics* 23, 26-27.

⁹⁶ *ibid.*

Article 6 of the Paris Agreement establishes Nationally Determined Contributions (NDCs) as a mechanism through which Parties can voluntarily cooperate to implement them in a cost-effective manner and to promote sustainable development and environmental integrity, thereby explicitly acknowledging the use of international carbon markets.⁹⁷ This article establishes two key frameworks for cooperation. Article 6.2 establishes a decentralised structure for bilateral or multilateral cooperation through the transfer of Internationally Transferred Mitigation Outcomes (ITMOs), subject to a robust accounting system designed to prevent double counting.⁹⁸ Article 6.4 establishes a central mechanism—the Paris Agreement Credit Mechanism (PACM)—for the creation and regulation of standardised emission reductions known as Article 6.4 Emission Reductions (A6.4ERs), which is managed under the authority of the Conference of the Parties and supervised by a designated body.⁹⁹

2.3.2. Internationally Transferred Mitigation Outcomes (ITMOs): Legal Characterisation

The legal nature of ITMOs under Article 6.2 is characterised by a fundamental uncertainty that sharply distinguishes them from the standard units of the Kyoto period. Article 6.2 does not specify the exact form that ITMOs must take. As noted by La Hoz Theuer, Schneider, Broekhoff, and Kollmuss, ITMOs could, in principle, be international units transferred between electronic registries or, alternatively, quantities reported by countries for accounting purposes.¹⁰⁰ To facilitate analytical purposes, the second definition has gained acceptance and has been adopted in academic circles. Accordingly, ITMOs should be regarded not as independent units conferring ownership rights to their holders, but as accounting quantities used to track whether countries are meeting their NDC targets.¹⁰¹

This definition has direct and significant implications for the private law classification of carbon instruments established under Article 6(2). Unlike AAUs, CERs, or EUAs—which are distinct and identifiable instruments held in central registries regardless of their legal classification—

⁹⁷ Paris Agreement (n 5) art 6(1).

⁹⁸ Paris Agreement (n 5) art 6(2); UNFCCC, Decision 2/CMA.3, 'Guidance on cooperative approaches referred to in Article 6, paragraph 2, of the Paris Agreement', FCCC/PA/CMA/2021/10/Add.1 (13 November 2021).

⁹⁹ Paris Agreement (n 5) art 6(4); UNFCCC, Decision 3/CMA.3, 'Rules, modalities and procedures for the mechanism established by Article 6, paragraph 4, of the Paris Agreement', FCCC/PA/CMA/2021/10/Add.1 (13 November 2021).

¹⁰⁰ Stephanie La Hoz Theuer, Lambert Schneider, Derik Broekhoff and Anja Kollmuss, *International Transfers under Article 6 in the Context of Diverse Ambition of NDCs: Environmental Integrity Risks and Options to Address Them* (SEI Working Paper 2017-10, Stockholm Environment Institute, November 2017) 4.

¹⁰¹ *ibid.*

ITMOs cannot be subject to a uniform international format. Their validity, transferability, and ultimately their value and trade as an asset in the private sector are entirely dependent on the host country's relevant regulations: the accounting mechanism by which the transferring state deducts the relevant emission reduction from its own NDC progress to prevent double counting.¹⁰² As Fattouh and Maino also explain, when a Recipient Country uses ITMOs toward its NDC, the Host Country must add back an amount of emissions equivalent to the annual emissions balance it reported in its Biennial Transparency Report; the Recipient Country, meanwhile, must simultaneously subtract the same amount from its own balance.¹⁰³ Pursuant to Article 6.3, the use of ITMOs for the implementation of NDCs will be voluntary and authorised by the participating Parties,¹⁰⁴ and ITMOs used by private companies in voluntary or compliance markets outside the Host Country will also be subject to similar adjustments. However, the exact timing of their implementation varies depending on the cooperation arrangements.¹⁰⁵

Consequently, a corporate buyer's property right under private law in an ITMO-backed carbon credit is structurally dependent on government administrative actions that are entirely beyond the buyer's control. This situation gives rise to a risk profile and set of possibilities that are qualitatively different from those of the Kyoto units examined above. While ERU holders face a delivery risk stemming from the host country's failure to convert AAUs, ITMO holders face a more fundamental and severe risk: their asset could become legally worthless if the host country fails to implement or rejects the relevant adjustment. As Spilker and Nugent noted, building on the analysis by Kreibich and Hermwille, any carbon unit traded without an appropriate adjustment link to the Paris Agreement's accounting framework carries the risk of triggering a "race to the bottom" among competing offset providers and ultimately undermines the asset's environmental integrity and legal validity.¹⁰⁶

In the wake of the Paris Agreement, the issue of the ownership status of carbon credits has increasingly and intensely drawn the attention of private international law institutions. In its

¹⁰² Bassam Fattouh and Andrea Maino, *Article 6 and Voluntary Carbon Markets* (OIES Energy Insight 114, Oxford Institute for Energy Studies, May 2022) 6-7.

¹⁰³ *ibid* 6.

¹⁰⁴ Paris Agreement (n 5) art 6(3); UNFCCC, Decision 2/CMA.3 (n 98).

¹⁰⁵ Fattouh and Maino (n 102) 7.

¹⁰⁶ Gregor Spilker and Nick Nugent, 'Voluntary carbon market derivatives: Growth, innovation & usage' (2022) 22(S2) *Borsa Istanbul Review* S109, citing Nicolas Kreibich and Lukas Hermwille, 'Caught in between: credibility and feasibility of the voluntary carbon market post-2020' (2021) 21(7) *Climate Policy* 939.

2025 Secretariat Report, the UNIDROIT Working Group on the Legal Nature of Verified Carbon Credits reached a consensus that the characteristics of ownership common to all legal systems may also be found in verified carbon credits.¹⁰⁷ Draft Principle 3(1) of the developing framework provides that verified carbon credits may be the subject of property rights; The Working Group has identified four fundamental characteristics supporting this classification: the credit must be individualisable, controllable, rivalrous, and transferable.¹⁰⁸ However, and most importantly, Draft Principle 3(4) upholds the primacy of applicable domestic law in determining whether a person holds property rights over a carbon credit, subject only to limited exceptions.¹⁰⁹ This respect for national legal systems reflects the approach adopted by the Court of Justice of the European Union (ECJ) regarding EUAs in the *ArcelorMittal* case and confirms that the private law governance of carbon instruments—whether generated under the EU ETS or Article 6 mechanisms—remains fundamentally fragmented across jurisdictions.

2.3.3. Article 6.4 Emission Reductions (A6.4ERs): Continuity and Divergence from CERs

Article 6.4 Emission Reductions (A6.4ERs) are established under the centralised PACM, which is directly managed by the Article 6.4 Supervisory Body of the United Nations Framework Convention on Climate Change (UNFCCC), and are thus structurally similar to Kyoto CERs. However, they differ from CERs in a critical legal respect. Since all Parties to the Paris Agreement now have NDCs covering at least a part of their economies, the host country of an A6.4ER project cannot permit the issuance of the emission reduction without accounting for its results. When A6.4ERs are authorised for use toward the implementation of NDCs or other international reduction objectives, they constitute ITMOs and are subject to relevant adjustments upon the first transfer.¹¹⁰ The host country must explicitly authorise the international use of A6.4ERs in accordance with Article 6.4,¹¹¹ and by doing so, commits to applying the necessary accounting adjustments. This commitment creates an arrangement structurally similar to the risks defined in the context of Kyoto ERUs within the private law relationship between the project developer and the credit purchaser, but it introduces a more widespread risk of sovereignty transfer. As the HCJP notes, clarifying the legal status of

¹⁰⁷ UNIDROIT Working Group on the Legal Nature of Verified Carbon Credits, *Secretariat's Report* (UNIDROIT 2025 - LXXXVI - W.G.6 - Doc. 2, September 2025) 16, para 57.

¹⁰⁸ *ibid* 16, para 58.

¹⁰⁹ *ibid* 16-17, para 61.

¹¹⁰ Fattouh and Maino (n 102) 5-6.

¹¹¹ Paris Agreement (n 5) art 6(4); UNFCCC, Decision 3/CMA.3 (n 99).

voluntary carbon credits and the mechanism for their transfer would also help to define the regime applicable to credits issued under the future mechanism envisaged in Article 6.4 of the Paris Agreement.¹¹²

2.3.4. Unresolved Legal Ambiguities and Implications for Private Law Governance

Despite the adoption of the Article 6 rulebook at COP26 in Glasgow, significant legal uncertainties that substantially impact and complicate the private-law governance of carbon instruments under the Paris Agreement remain unresolved. Most importantly, at COP28, delegates failed to reach consensus on key issues, including the definition of a collaborative approach and the rules and processes governing the revocation of ITMO permits. This failure highlights the challenges that lead to uncertainty, complicating and delaying host countries' efforts to build capacity and encourage private investment.¹¹³ The lack of clear international rules on revocation creates deep uncertainty regarding the security and permanence of private property rights related to Article 6 carbon credits. If a host country revokes a permit that has already been issued, private buyers face the risk of their assets becoming invalid because there is no established international legal framework governing compensation or refunds. Fattouh and Maino note that this buyer liability exerts downward pressure on carbon credit prices and has a negative impact on the reliability and predictability of transfers.¹¹⁴

The UNIDROIT Working Group has acknowledged this structural weakness. In the draft framework it prepared, it specifically addressed the issues of cancellation, revocation, and invalidation of carbon credits through Principles 8, 9, and 10, and the insolvency of custodians through Principle 17. The status of these areas under public international law, as it pertains to Article 6 instruments, remains largely unaddressed.¹¹⁵ The Working Group explicitly acknowledges the specific challenges posed by the risk that a verified emission reduction might be lost or later deemed to have never existed over the typically long lifespan of the relevant climate project. This concern applies directly to A6.4ERs in the event that the host country is unable to maintain the conditions that formed the basis of the original authorisation.¹¹⁶

¹¹² Haut Comité Juridique de la Place Financière de Paris (n 27) 20.

¹¹³ World Bank, *State and Trends of Carbon Pricing 2024* (World Bank, Washington DC 2024) 54-55.

¹¹⁴ Fattouh and Maino (n 102) 12-13.

¹¹⁵ UNIDROIT Working Group (n 107) 14.

¹¹⁶ *ibid* 17-18.

This structural uncertainty stands in sharp contrast to the Kyoto framework. For within the Kyoto framework—despite the significant institutional weaknesses discussed above—the legal status of carbon credits was, at least formally, defined at the international level and managed through centralised registry systems. Under the bottom-up architecture of the Paris Agreement, the legitimacy of carbon credits and the rights of private actors depend to an unprecedented degree on the host country’s domestic legislation, the terms of bilateral agreements, and competing private certification standards, thereby shifting regulatory, financial, and reputational risks to private investors in a manner that current private law frameworks in EU member states are ill-equipped to address.¹¹⁷

2.3.5. Private Law Rules Governing ITMO Transfers: An Emerging Lacuna

Within the framework of public international law, the structural uncertainty surrounding ITMOs is further exacerbated by the almost complete absence of private law rules governing their transfer, collateralisation and treatment in insolvency proceedings. This gap is not accidental; rather, it reflects the fact that the framework of Article 6 is still in its developmental stage and constitutes one of the most significant unresolved issues in the private law governance of carbon markets.

Regarding the law applicable to ITMO transfers, no international instrument has yet determined which law is to apply. In the literature, two different approaches have emerged on this matter for similar carbon instruments. Under the EU Emissions Trading Scheme, Article 11(5) of the Registry Regulation (No 389/2013) states that accounts and the units held in those accounts are subject to the law of the Member State in which the administering body is established, and by referring to the location of the registry. It effectively applies the *lex rei sitae* principle.¹¹⁸ As regards voluntary carbon credits, the HCJP has confirmed that contract-based transactions are governed by the *lex contractus* under the Rome I and Rome II Regulations, whilst security rights are determined according to the *lex rei sitae*, with the location of the registry or the registrar serving as the relevant connecting factor.¹¹⁹ For ITMOs, which lack a central registry and any framework for the resolution of conflicts of international law, no such rule exists in this context. Consequently, the law applicable to the transfer of an ITMO must be determined entirely by

¹¹⁷ Verde and Borghesi (n 95) 26-27; Kreibich and Hermwille (n 106) 939.

¹¹⁸ Commission Regulation (EU) No 389/2013 of 2 May 2013 establishing a Union Registry pursuant to Directive 2003/87/EC [2013] OJ L122/1, art 11(5); Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 122-24.

¹¹⁹ Haut Comité Juridique de la Place Financière de Paris (n 27) 22.

the internal private international law of the jurisdiction in which the transaction takes place. As a result, there is significant legal uncertainty regarding cross-border transactions.

The use of ITMOs as collateral or security has not been addressed in a manner similar to the approach outlined above. With regard to EU Emission Allowances, the Milieu report has identified a structural obstacle: the Union Registry does not support the registration of limited rights over emission allowances (including security interests); this significantly restricts the enforceability of such rights against third parties.¹²⁰ For voluntary carbon credits, the HCJP has confirmed that parties may create security rights over carbon credits¹²¹ and UNIDROIT's Draft Principle 18 proposes a framework for secured transactions using verified carbon credits as collateral.¹²² There is no equivalent framework regulating ITMOs within this scope. This leads to the conclusion that the use of ITMO-backed loans for security and pledge rights must rely entirely on national transactions and regulations. The fact that outcomes may vary significantly depending on the jurisdiction will give rise to legal issues.

A similar degree of uncertainty persists regarding the insolvency proceedings of ITMOs. With regard to EU Emission Allowances, the EU Insolvency Regulation (2015/848) does not provide any specific guidance and leaves the regulation of this matter to national law. In the United Kingdom, emission allowances form part of the insolvent entity's realisable assets, whereas in Poland they are included in the insolvency estate as intangible property rights.¹²³ For voluntary carbon credits, UNIDROIT's Draft Principle 17 proposes that credits recorded in a registry cannot be used to satisfy the claims of the registry operator's creditors. No such protection exists for ITMO holders.¹²⁴ The absence of an equivalent rule for ITMOs means that, in the event of the insolvency of an intermediary or custodian, the legal title of ITMO holders may be entirely extinguished under applicable domestic insolvency law.

When considered as a whole, it can be said that the private law framework governing Article 6 carbon instruments remains underdeveloped and nascent. Although relatively well-developed frameworks have been established in the literature regarding the treatment of Kyoto units and EU Emission Allowances under private law, the transfer, collateralisation and treatment of ITMOs and A6.4ERs in the event of insolvency remain areas where clarity has not yet been

¹²⁰ Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 124.

¹²¹ Haut Comité Juridique de la Place Financière de Paris (n 27) 22.

¹²² UNIDROIT Working Group on the Legal Nature of Verified Carbon Credits (n 107) 14.

¹²³ Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 126-27.

¹²⁴ UNIDROIT Working Group on the Legal Nature of Verified Carbon Credits (n 107) 14.

established and which remain unknown. This observation reinforces the main argument of this thesis, namely that the lack of harmonisation in the private law of carbon instruments leads to systemic fragmentation with direct consequences for market participants.

2.4. Voluntary Carbon Credits (VCCs): Private Law Classification and Governance

An examination of Kyoto units, EU Emissions Trading System allowances and Paris Agreement instruments has revealed that carbon credits created under public regulatory frameworks resist being fitted into or confined to any single legal category. Voluntary carbon markets, which are established and operate outside mandatory regulatory frameworks, further exacerbate this uncertainty. Voluntary Carbon Credits are created not by sovereign authorities, but through contractual interactions between private standard-setting bodies, project developers and verifiers. This situation raises fundamental questions and issues regarding the private law nature, transferability and enforceability of the resulting instruments.

2.4.1. Definition and Distinction from Compliance Carbon Units

A Voluntary Carbon Credit (VCC) is a transferable instrument representing the reduction or removal of one tonne of carbon dioxide equivalent greenhouse gas emissions; it is created by private certification bodies and issued and verified in accordance with recognised quality standards, without any mandatory legal obligation.¹²⁵ Whilst EU legislation for EUAs or public international law for CERs and ERUs define the legal force of compliance carbon units through a sovereign legislative authority, VCCs operate entirely within a private contractual ecosystem without a central public law framework regulating their issuance, transferability or enforceability.¹²⁶

2.4.2. Legal Nature and Comparative Private Law Treatment

The prevailing view in the literature defines VCCs as intangible assets that may be subject to property rights. The HCJP has carried out the most comprehensive analysis of national law to date and has concluded that VCCs are not securities — as they do not confer equity rights or represent debt obligations — nor are they contractual claims, as their value is based on the underlying environmental benefit rather than a legal obligation of one party towards

¹²⁵ Haut Comité Juridique de la Place Financière de Paris (n 27) 5.

¹²⁶ *ibid* 14-15.

another.¹²⁷ Instead, VCCs are classified as intangible movable assets — *biens meubles incorporels* — as they possess economic value, are subject to exclusive ownership and are transferable.¹²⁸

At the international level, the UNIDROIT Working Group has reached a consensus that VCCs may be the subject of property rights. Draft Principle 3(1) identifies four universal characteristics of property in a VCC. A VCC is distinguishable, controllable, rivalrous and transferable.¹²⁹ Most importantly, however, Draft Principle 3(4) upholds the primacy of applicable domestic law in determining whether a person holds a property right in a VCC, subject only to limited exceptions.¹³⁰ This approach mirrors that adopted by the Court of Justice in the *ArcelorMittal* case regarding EUAs and confirms that the governance of carbon instruments remains fundamentally fragmented across jurisdictions.

Streck and von Unger have put forward an academic argument in support of this view. The pair argue that carbon credits issued in exchange for environmental services constitute private property with a clear economic value and a sound legal basis, and that this property is protected against theft or expropriation under property law, tort law or the law of unjust enrichment in most national legal systems.¹³¹

Although there are significant differences in the mechanisms governing the recognition, establishment and enforcement of rights, this concept of ownership has been recognised in both the English common law and civil law systems, broadly speaking, in similar forms and under similar conditions. Under English law, the courts have assessed carbon credits as a form of intangible property that is transferable, capable of being used as security, and protected against third-party interference, by drawing parallels with waste management licences.¹³² Australian law has gone a step further by enacting state legislation recognising carbon sequestration rights arising from forestry projects. In New South Wales and Victoria, such rights can be registered in the land registry under the Torrens system and treated as property rights that are transferred along with the land. This is a robust form of protection not found in most other jurisdictions.¹³³ Within the civil law tradition, the People's Republic of China classifies CERs

¹²⁷ *ibid* 19-20.

¹²⁸ *ibid*.

¹²⁹ UNIDROIT Working Group (n 107) 16, paras 57-58.

¹³⁰ *ibid* 16-17, para 61.

¹³¹ Streck and von Unger (n 20) 188.

¹³² Low and Lin (n 57) 138.

¹³³ *ibid* 143-44.

and carbon credits as intangible movable property under property law and accounting standards. China's approach is generally consistent with the French characterisation of *biens meubles incorporels*.¹³⁴ This convergence regarding the fundamental property nature of CERs is significant, but it should not obscure the continuing significant differences between jurisdictions regarding the creation of rights, priority and enforceability.

2.4.3. Private Standard-Setting Bodies and the Legal Status of Registries

VCCs are issued by private certification bodies—primarily Verra, the Gold Standard, the American Carbon Registry and the Climate Action Reserve—which are generally structured as non-profit organisations. The role of these organisations is to set compliance standards, verify emission reductions through independent auditors, and issue credits to project developers via electronic registration systems.¹³⁵

The private law status of these organisations has significant implications for the enforceability of VCC ownership rights. The ledgers are based on terms and conditions that explicitly state they accept no liability for determining the ownership of carbon credits, with the aim of protecting themselves from liability. Verra and Gold Standard state that they do not guarantee legal ownership rights in any way and that users rely on the registry at their own risk. The registry is maintained not as an authoritative legal record of ownership rights, but solely for the convenience and predictability of the parties.¹³⁶ This contractual structure seriously undermines the legal certainty of the purchaser's ownership rights. Unlike the EU Emissions Trading Registry, which provides *prima facie* evidence of ownership rights under the Registry Regulation, there is no equivalent legal protection for VCC holders under voluntary registry systems.

The inadequacy of private certification schemes is an issue that is attracting increasing attention from international regulatory bodies. In its Final Report on Voluntary Carbon Markets dated November 2024, IOSCO explicitly acknowledged that, the legal treatment of carbon credits for private law purposes falls outside the remit of financial market regulators, and confirmed that it is closely monitoring the work of UNIDROIT and UNCITRAL to understand the outcomes of their joint studies on the private law aspects of carbon credits. These studies cover the

¹³⁴ Tung (n 24) 505.

¹³⁵ Haut Comité Juridique de la Place Financière de Paris (n 27) 13.

¹³⁶ *ibid* 14, fn 30.

creation, transfer, cancellation, substitutability, collateralisation and insolvency treatment of carbon credits.¹³⁷ This institutional recognition that the private law classification of VCCs remains an open question — one that has not even been resolved at the level of international securities regulation — strongly confirms the *sui generis* thesis put forward in this section.

At EU level, a public certification framework for carbon removal activities was first established with the adoption of Regulation (EU) 2024/3012, which creates a voluntary Union framework for the certification of permanent carbon removal, carbon farming and carbon sequestration in products.¹³⁸ This Regulation does not directly regulate VCCs issued under existing voluntary standards such as Verra or the Gold Standard, but it marks the beginning of a transition from a purely private certification regime for carbon removal units in the EU to a hybrid public-private sector framework. This development has significant implications, particularly regarding the future private law treatment of carbon removal credits.

2.4.4. Categories of VCCs and the Fungibility Problem

Voluntary markets encompass a broad range of credit categories across several different types. Examples include nature-based projects such as reforestation and the prevention of deforestation under REDD+; technology-based projects such as renewable energy and methane capture; and processes and projects such as carbon dioxide removal credits involving direct air capture or geological storage. Avoids, which represent the prevention of future emissions, account for approximately 80 per cent of the voluntary market.¹³⁹

The underlying project category, whilst not altering the fundamental legal nature of the VCC as an intangible asset, nevertheless has significant implications in terms of transferability. As confirmed and argued by the HCJP, a carbon credit is inextricably linked to a specific underlying project. This proves that a VCC linked to one project cannot be exchanged for a VCC linked to another project. In particular, it is accepted that exchanges cannot be made between different project categories or between credits certified by different bodies.¹⁴⁰ This restriction on fungibility distinguishes VCCs from the EU ETS. EUAs within the EU ETS are

¹³⁷ International Organization of Securities Commissions, *Good Practices for Voluntary Carbon Markets* (IOSCO FR08/2024, November 2024) 30.

¹³⁸ Regulation (EU) 2024/3012 of the European Parliament and of the Council of 27 November 2024 establishing a Union certification framework for permanent carbon removals, carbon farming and carbon storage in products [2024] OJ L/2024/3012 (Carbon Removals Certification Framework Regulation).

¹³⁹ Fattouh and Maino (n 102) 2.

¹⁴⁰ Haut Comité Juridique de la Place Financière de Paris (n 27) 41-42.

fully fungible. This situation has direct implications for the structuring of standardised derivative products based on VCCs. Passero has also identified another consequence of this categorical diversity from a private law perspective: given that biological carbon stored in trees and soil is generally regarded as part of immovable property, the legal uncertainty regarding whether a forestry-based VCC constitutes a property right could result in such credits being subject to local property taxes, conservation easements and constitutional property protections, which could give rise to a fundamentally different private law treatment from the intangible asset classification favoured by the HCJP and UNIDROIT.¹⁴¹

2.4.5. Environmental Integrity Concerns and Market Crisis

The legal soundness and reliability of a VCCs are underpinned by its environmental integrity. This integrity, in turn, stems from three fundamental technical concepts: additionality, permanence and leakage. Ensuring additionality is contingent upon the condition that the emission reductions in question would not have occurred without the financing provided by carbon credits.¹⁴² Permanence, on the other hand, requires that emission reductions are sustainable and long-term. Certification bodies typically meet this requirement by establishing buffer pools to provide protection against reversals.¹⁴³ Leakage refers to the risk that a reduction action in one location may shift emissions elsewhere, thereby undermining the net environmental benefit.¹⁴⁴ As Paul and others note in the context of soil carbon sequestration projects, the challenge of ensuring permanence throughout the lifespan of an agricultural project presents an insurmountable difficulty for private certification providers, whilst the assessment of leakage is made particularly difficult by the dynamic and complex nature of agricultural systems.¹⁴⁵

These integrity requirements have direct implications under private law. The voluntary market has been the subject of ongoing empirical criticism that has fundamentally transformed the legal landscape since 2023. An investigation conducted by *The Guardian*, *Die Zeit* and *SourceMaterial*, based on peer-reviewed academic research, concluded that over 90 per cent of Verra-certified rainforest offset credits likely do not represent actual carbon

¹⁴¹ Michelle Passero, 'The Voluntary Carbon Market' in Freestone and Streck (eds) (n 8) 527-29.

¹⁴² Haut Comité Juridique de la Place Financière de Paris (n 27) 11.

¹⁴³ *ibid.*

¹⁴⁴ Carsten Paul and others, 'Carbon farming: Are soil carbon certificates a suitable tool for climate change mitigation?' (2023) 330 *Journal of Environmental Management* 117142, 9.

¹⁴⁵ *ibid* 5, 9.

reductions, leading to a sudden crisis of confidence in corporate sustainability portfolios and exposing buyers to greenwashing claims.¹⁴⁶ As the World Bank has also noted, this investigation has had widespread reputational and legal consequences for large companies that rely on voluntary credits to support their environmental claims.¹⁴⁷

The legal consequences of integrity breaches in the voluntary carbon offset (VCC) system have begun to take shape as they emerge in court cases. In the class-action lawsuit *Mayanna Berrin v Delta Air Lines Inc*, filed in the U.S. District Court for the Central District of California, the plaintiff argued that Delta's claim to be "the world's first carbon-neutral airline" was false, asserting that purchasing such offset credits cannot make a company carbon-neutral due to fundamental issues in the voluntary carbon offset market.¹⁴⁸ In December 2024, the court rejected Delta's motion to dismiss part of the case, noting that the plaintiff had demonstrated the right to seek a preliminary injunction because she could not rely on the validity of Delta's ongoing carbon-neutral claims in future purchasing decisions.¹⁴⁹ This case confirms that companies' reliance on voluntary carbon credits with questionable integrity exposes the purchaser not only to reputational risk but also to legal liability under consumer protection laws. This outcome stems directly from the absence of a reliable legal framework that guarantees the environmental integrity—and thus the value—of such credits.

In accordance with UNIDROIT Draft Principle 8, a VCC that has been cancelled due to a breach of integrity ceases to be subject of a right of ownership, and the VCC registry must not, thereafter, comply with any request for the transfer or cancellation of the cancelled credit.¹⁵⁰ How the resulting loss is to be apportioned amongst project developers, certification bodies, intermediaries and end-users constitutes one of the most significant unresolved private law issues facing the voluntary market. In response to these systemic failures, market participants have moved towards greater contractual standardisation following the International Swaps and Derivatives Association's publication in February 2024 of *Definitions of Verified*

¹⁴⁶ World Bank (n 113) Endnote 69, citing Patrick Greenfield, 'Revealed: More than 90% of Rainforest Carbon Offsets by Biggest Certifier Are Worthless' *The Guardian* (London, 18 January 2023).

¹⁴⁷ *ibid.*

¹⁴⁸ *Mayanna Berrin v Delta Air Lines Inc*, No 2:23-cv-04150-MEMF-MRW (CD Cal, filed 30 May 2023).

¹⁴⁹ *ibid.*, Order Denying Partial Motion to Dismiss (11 December 2024).

¹⁵⁰ UNIDROIT Working Group (n 107) 17-18.

Carbon Credit Transactions, Version 2, thereby providing harmonised contractual terms for physically settled secondary market transactions.¹⁵¹

2.4.6. Human Rights, Indigenous Peoples and Land Tenure Dimensions

The treatment of voluntary carbon offset projects (VCCs) under private law cannot be fully understood without taking into account the land ownership aspects that underpin these projects. Many voluntary carbon offset projects — particularly REDD+ forestry initiatives — are situated on land traditionally inhabited by indigenous and forest-dependent communities. This raises serious questions regarding the legitimacy of the property rights upon which VCCs ultimately rely.

Voigt identified this dimension in the context of CDM projects, noting that climate mitigation projects could lead to the displacement or migration of people and affect the livelihoods of local communities, which could in turn have serious consequences for the property rights of the affected communities.¹⁵² O’Sullivan and Saines, analysed this issue specifically within the context of REDD+ and noted that the absence of clear land tenure regimes and the inconsistent application of existing ones constitute a fundamental barrier to scaled-up REDD investments, requiring developers to conduct a more comprehensive assessment to identify and obtain the consent of all parties with potential claims to the land, including indigenous communities.¹⁵³ Danish noted that the proposed legal frameworks seek to ensure that REDD offsets recognise the right of affected indigenous communities to free, prior and informed consent, taking into account the structural risks that REDD-based credits pose to forest-dependent peoples.¹⁵⁴

These factors form a crucial part of the private law analysis. Should a VCC be established without the indigenous peoples’ land rights being properly recognised, the credit may subsequently be subject to challenges under domestic property law. This situation could have adverse consequences for the property rights of all subsequent purchasers. The fragility of the

¹⁵¹ World Bank (n 113) Endnote 99, citing International Swaps and Derivatives Association, *ISDA Verified Carbon Credit Transactions Definitions, Version 2* (ISDA, 7 February 2024).

¹⁵² Christina Voigt, 'Responsibility for the Environmental Integrity of the CDM' in Freestone and Streck (eds) (n 8) 277, 291.

¹⁵³ Stephen O’Sullivan and Richard Saines, 'International Market Solutions to Protect Tropical Rainforests' in Freestone and Streck (eds) (n 8) 598-99.

¹⁵⁴ Kyle W Danish, 'A Policymaker's Guide to Climate Trading and Investment Issues for the Post-2012 Period' in Freestone and Streck (eds) (n 8) 436.

underlying land ownership forms the basis for the fragility of the resulting private law property right.

These concerns have been brought to light in recent cases heard in various judicial districts. In its 2024 *Decision No. T-248*, the Colombian Constitutional Court — ruling for the first time on a dispute related to the voluntary carbon market — ruled that the developers of the Baka Rokarire REDD+ project had violated the Pirá Paraná indigenous communities' rights to self-determination, autonomy, land, and free, prior, and informed consent.¹⁵⁵ The Court found that the developers had failed to fulfil their duty of care by bypassing traditional indigenous governance structures, ordered the project to be suspended immediately, and stated that any REDD+ project carried out on indigenous lands must strictly adhere to traditional decision-making systems.¹⁵⁶ In Brazil, the Federal Prosecutor's Office has initiated a series of public law lawsuits seeking the suspension and cancellation of REDD+ carbon credits issued for projects in the state of Amazonas. The grounds cited are that the projects were implemented without the free, prior, and informed consultation process required under ILO Convention No. 169 with indigenous and traditional communities.¹⁵⁷ These lawsuits demonstrate that the private law title of a VCC buyer under a project lacking adequate land tenure foundations is structurally vulnerable to being subsequently invalidated through suspension, cancellation, or legal challenge. This represents a risk that current contractual frameworks for voluntary carbon credit transactions have not yet adequately addressed.

2.4.7. Transfer, Collateral, Insolvency and Regulatory Gaps

The private law rules governing VCC transfers apply a two-part conflict-of-laws analysis. Contractual obligations arising from a VCC transaction are governed by the *lex contractus* under the Rome I and Rome II Regulations.¹⁵⁸ The property-related aspects of the transfer — including the law applicable to security rights and the creation of a right of ownership — are determined in accordance with the *lex rei sitae* principle. For these intangible

¹⁵⁵ *Consejo Indígena del Pirá Paraná v Corporación para el Manejo Sostenible de los Bosques (Masbosques)*, Corte Constitucional de Colombia, Sentencia T-248/24 (25 June 2024).

¹⁵⁶ *ibid.*

¹⁵⁷ *Ministério Público Federal v Estado do Amazonas and FUNAI*, Ação Civil Pública nº 1040956-39.2024.4.01.3200 (Justiça Federal, 2024); *see also* the Federal Public Prosecutor's civil actions against the Evergreen REDD, Fortaleza Ituxi REDD and Unitor REDD projects (2024-2025), seeking cancellation of all associated credits.

¹⁵⁸ Haut Comité Juridique de la Place Financière de Paris (n 27) 17.

assets, the place where the register or the registrar is located is taken as the connecting factor.¹⁵⁹ The withdrawal of a VCC from circulation — that is, where an owner uses the credit to offset their own issues and removes the credit from circulation — extinguishes the property right in the credit. Once notification has been given to the registrar, no further transfer may be effected and the credit is permanently withdrawn from circulation.¹⁶⁰

It is also possible to use VCCs as security or a charge. The HCJP has confirmed that the parties may create a security interest in carbon credits.¹⁶¹ Articles 18, 19 and 20 of the UNIDROIT Draft Principles, meanwhile, propose that security interests in VCCs be made effective against third parties through registration in a VCC registry or by means of a control agreement.¹⁶² In the context of insolvency, UNIDROIT Draft Principle 17 provides that VCCs held by a custodian on behalf of a client cannot be used to satisfy the claims of the custodian's creditors in the event of insolvency, thereby protecting the client's right of ownership.¹⁶³

The risk of greenwashing that this framework aims to address is most strikingly evident in the lawsuit between *Fossielvrij NL and Koninklijke Luchtvaart Maatschappij NV*. On 20 March 2024, the Amsterdam District Court ruled that 15 of KLM's 19 environmental marketing claims—including the purchase of carbon offset products purporting to significantly reduce the climate impact of flights—were misleading and unlawful under the Dutch Unfair Commercial Practices Act. This ruling marks the first instance in Europe where an airline has been reprimanded by a court for greenwashing.¹⁶⁴ Although the ruling is grounded in consumer protection law rather than private law, it confirms that the absence of a reliable public framework regulating the integrity of voluntary carbon credits directly leads to misleading environmental claims based on their use.

One of the key features of the legal framework governing VCCs is the significant regulatory gap that also exists at EU level. Carbon credits do not constitute financial instruments within the meaning of MiFID II. Consequently, spot market transactions relating to VCCs cannot fall within the scope of financial market regulation. Therefore, market operators may open their platforms to VCC trading without obtaining any authorisation, and in such cases, the Market

¹⁵⁹ *ibid* 22.

¹⁶⁰ *ibid* 12, 18.

¹⁶¹ *ibid* 22.

¹⁶² UNIDROIT Working Group (n 107) 19, paras 70-71.

¹⁶³ *ibid* 19, para 69.

¹⁶⁴ *Stichting Fossielvrij NL v Koninklijke Luchtvaart Maatschappij NV*, Rechtbank Amsterdam, ECLI:NL:RBAMS:2024:1512 (20 March 2024) [C/13/719848 / HA ZA 22-524].

Abuse Regulation will not apply.¹⁶⁵ IOSCO has explicitly acknowledged this regulatory divergence and noted that whilst some member jurisdictions, including Abu Dhabi and Egypt, have actively expanded their regulatory definitions to classify carbon credits as financial instruments, the overwhelming majority have not done so. IOSCO has rejected the imposition of a uniform solution and has instead recommended that local authorities seek regulatory outcomes consistent with those applicable to traditional financial markets.¹⁶⁶

EU law has begun to address voluntary carbon markets indirectly. The draft Green Claims Directive will explicitly regulate environmental claims based on the offsetting of greenhouse gas emissions—including those relying on the use of carbon credits—with the aim of preventing ‘greenwashing’.¹⁶⁷ The World Bank’s report “*The State and Trends of Carbon Pricing 2025*” documents that emerging market economies — including Zambia, Paraguay, Vietnam and Egypt — are driving a new wave. This situation reflects a growing awareness amongst sovereign legislative bodies that the absence of a publicly available legal framework for VCCs creates systemic risks for market participants.¹⁶⁸ Whilst this emerging legal landscape is, in principle, welcomed, it carries the risk of further fragmenting the treatment of VCCs under private law across an increasingly diverse range of national legal systems.

2.4.8. VCCs and Article 6 of the Paris Agreement: Adjusted versus Non-Adjusted Credits

The entry into force of the framework under Article 6 of the Paris Agreement has introduced a significant legal distinction between *adjusted* and *unadjusted* credits in the VCC market. An adjusted VCC is a credit for which the host country has officially approved international use and applied an appropriate adjustment to its NDC target, thereby preventing the relevant emission reduction from being double-counted. An unadjusted credit is created without this sovereign accounting adjustment and may be used by private companies for voluntary offsetting claims. However, it does not carry the same level of environmental integrity or public law approval.¹⁶⁹

¹⁶⁵ Haut Comité Juridique de la Place Financière de Paris (n 27) 24, 27.

¹⁶⁶ International Organization of Securities Commissions (n 137) 30-31.

¹⁶⁷ Haut Comité Juridique de la Place Financière de Paris (n 27) 33.

¹⁶⁸ World Bank, *State and Trends of Carbon Pricing 2025* (World Bank, Washington DC 2025) DOI: 10.1596/978-1-4648-2255-1.

¹⁶⁹ Fattouh and Maino (n 102) 6-7.

This distinction has profound implications for the property rights of VCC holders under private law. The relevant regulatory mechanism intertwines public international law with private property rights in a manner that significantly increases the risk of revocation. As explicitly stated in UNIDROIT Draft Principle 10, if the host state revokes the authorisation granted under Article 6, the VCC may be revoked *ab initio*. This effectively completely extinguishes the purchaser's property right and imposes a total loss on the private purchaser.¹⁷⁰ The time lag between the acquisition of the VCC and the host state's formal implementation of the relevant rectification creates a further period of legal uncertainty in which the validity of the purchaser's property right remains dependent on a sovereign administrative act.¹⁷¹

Viewed broadly, the 'adjusted/unadjusted' distinction demonstrates that the legal certainty of a VCC's property right under private law does not depend solely on the quality of the underlying emission reduction project, but is fundamentally contingent upon the willingness and capacity of sovereign states to fulfil their obligations under public international law within the framework of the Paris Agreement. This dependency, at the level of voluntary markets, reflects the sovereignty delivery risk identified above in the context of Kyoto ERUs and Paris ITMOs, thereby validating the main argument of this section. Across three generations of markets, the private law governance of carbon instruments is characterised by a structural fragility arising from the interaction between private economic rights and the exercise of sovereign public authority.

2.5. Synthesis: The Instrumental Property Character of Carbon Certificates

This section examines the treatment and legal nature of carbon instruments under private law across three successive generations of regulations, ranging from units allocated by the state during the Kyoto Protocol period to credits certified by the private sector in the voluntary carbon market. Although there are profound structural differences between these generations—in terms of their origins, such as public international law, EU environmental legislation or private contract regulations—the preceding sections have demonstrated that legal uncertainty manifests itself in a consistent and fundamental pattern. It is clear that each category of instrument has resisted being subsumed under a single pre-existing legal category, and that each has given rise to unresolved disputes at the intersection of property law, administrative law,

¹⁷⁰ UNIDROIT Working Group (n 107) 17-18.

¹⁷¹ Fattouh and Maino (n 102) 11.

financial regulation and private contracts. This uncertainty is not accidental, but rather structural. It reflects three fundamental characteristics shared by all carbon instruments, regardless of the regulatory generation from which they originate.

The first fundamental characteristic is *regulatory origin*. None of the carbon instruments examined in this section derive from the recognition of a pre-existing right. AAUs, CERs and ERUs were created by international agreements and implemented through sovereign administrative acts within the Kyoto Framework. EUAs, on the other hand, were issued by the competent authorities of Member States following their creation under the EU ETS Directive. The EU has deliberately refrained from specifying their private law nature, out of respect for national legal systems. ITMOs and A6.4ERs have been implemented through the authorisation of the host country and the administrative mechanism of the Paris Agreement. VCCs, on the other hand, are created through contractual interactions between private standard-setting bodies and project developers and are implemented by being recorded in private electronic ledgers in accordance with approvals issued by independent auditors. In each of these cases, the instrument in question arises not because of a voluntary exchange between the parties, but as a result of an action by a founding public or quasi-public authority. As Wemaere, Streck and Chagas have also noted, the state essentially converts non-property assets into public property and subsequently converts these into private property. This constitutes a legal transformation process that is unprecedented in traditional property law and deviates from the norm, fundamentally shaping the nature of the rights subsequently held by private parties.¹⁷²

The second key feature is *conditionality*. The legal value and validity of each carbon instrument depend not only on the private law rights of its holder, but also on the continuous and uninterrupted operation of the regulatory or contractual framework that gave rise to that instrument. This conditionality operates at various levels and takes different forms across three tiers. For AAUs and CERs, the source of conditionality lies in the structural dependencies of the Kyoto architecture. ERU holders have demanded that the host state implements the Track 2 conversion procedure, whilst CER holders remain dependent on the continued institutional integrity of the CDM. For EUAs, conditionality takes the form of regulatory intervention: the Market Stability Reserve, as identified in the Milieu Ltd study, grants the European Commission the authority to permanently cancel allowances—despite over 2 billion allowances potentially becoming invalid through this mechanism—without recognising any property rights

¹⁷² Wemaere, Streck and Chagas (n 8) 36-38.

in the affected instruments.¹⁷³ For ITMOs, conditionality manifests as a risk of cancellation. The host country may revoke its Article 6 authority, which could render the holder's credit invalid *ab initio* without any international legal framework governing compensation or reimbursement. For VCCs, unforeseen circumstances manifest as a risk to environmental integrity. If it is subsequently proven that the relevant emission reduction did not take place, or if the project certification body applies UNIDROIT Draft Principle 8, the credit ceases to be the subject of a property right.¹⁷⁴ Across all three levels, the private law title of the carbon instrument holder is structurally subject to being extinguished through public law actions. In this case, they cannot benefit from the protections normally afforded to traditional property rights holders under domestic constitutional or private law.

The third key feature is *the fragmentation of jurisdiction*. In the judicial jurisdictions examined in this section, no uniform definition has been established under private law for any category of carbon instrument, nor is one likely to be established. Furthermore, it seems unlikely that such a definition could be achieved within the current framework of EU and private international law. A comparative analysis of how the EUA is treated in five Member States has revealed five significant classifications: a *in rem* property right in France, a dual administrative and property right in Poland, a mixture of constitutional and financial rights in Germany, an intangible property right under common law in the UK, and a financial instrument in Belgium. Whilst each of these is legally defensible within its own system, they are incompatible with one another at EU level. The Court of Justice's ruling in the *ArcelorMittal* case, when considered alongside Article 345 TFEU, has confirmed that this fragmentation is constitutionally entrenched. The EU lacks the authority to harmonise the legal classification of EUAs under property law, and the legal systems of Member States retain full sovereignty in this area.¹⁷⁵ The absence of a centralised registration system and a valid legal framework for ITMOs perpetuates this fragmentation, extending it into the Paris Agreement era. The consequence of VCC issuance being dependent on private certification bodies operating under conflicting contractual terms is the continuation of the same fragmentation in the voluntary market.

In this context, there is a consensus within the academic literature based on the division of opinion regarding the correct legal classification of carbon instruments. The *sui generis* school, most notably represented by Wemaere, Streck and Chagas, argues that these instruments

¹⁷³ Milieu Ltd, Ecologic and Klimapolitika (n 55) 167; Ylihjeljo (n 68) 45-46, 51.

¹⁷⁴ UNIDROIT Working Group (n 107) 17-18.

¹⁷⁵ Case C-321/15, *ArcelorMittal* (n 19); TFEU art 345.

constitute a set of entirely new and previously undefined rights that cannot be fitted into any existing legal category and must therefore be treated as an independent class.¹⁷⁶ Button, frequently cited by Manea, argues that carbon units exhibit the characteristics of both a commodity and a currency simultaneously, and that regulatory trading systems define the instrument not by its legal nature, but by *what it enables the holder to do*. This is a technique of definition that reduces the issue to a pre-existing structure rather than resolving the classification problem.¹⁷⁷ Legnaioli characterises EUAs as a *hybrid form of property or regulatory property*. They are instruments granted by administrative decision, yet endowed with economic value and tradability. Their hybrid character resists being reduced to either the category of pure property or that of a pure administrative permit.¹⁷⁸

According to the opposing view, which has been particularly vigorously defended by Low and Lin, the use of the term *sui generis* does not reflect the true uniqueness of carbon instruments. On the contrary, in their words, it reflects a failure to appreciate the legal nature of intangible property and a misunderstanding of the way in which registers of rights operate.¹⁷⁹ They argue that EUAs should most accurately be understood as intangible property—such as a *chose in action* or a credit balance in a bank account—an instrument enforceable against specific parties rather than *erga omnes*, and that existing private law categories, when correctly applied, can accommodate the distinctive features of these instruments without resorting to a new classification.¹⁸⁰ The English High Court, in the case of *Armstrong DLW GmbH v Winnington Networks Ltd*, reached the same conclusion in practice by holding that EUAs constitute intangible property under the common law through analogy with established case law on milk quotas and waste management licences, without deeming it necessary to create a new category.¹⁸¹ The HCJP similarly classified VCCs within the category of *biens meubles incorporels* under existing French civil law and treated them as intangible movable assets subject to standard property rules. Streck and von Unger, however, have argued that carbon

¹⁷⁶ Wemaere, Streck and Chagas (n 8) 36-38.

¹⁷⁷ Manea (n 72) 40-42, citing Jillian Button, 'Carbon: Commodity or Currency? The Case for an International Carbon Market Based on the Currency Model' (2008) 32 Harvard Environmental Law Review 571.

¹⁷⁸ Legnaioli (n 90) 36.

¹⁷⁹ Low and Lin (n 57) 377.

¹⁸⁰ *ibid* 395-96.

¹⁸¹ *Armstrong DLW GmbH v Winnington Networks Ltd* [2012] EWHC 10 (Ch); *Milieu Ltd, Ecologic and Klimapolitika* (n 55) 48, 54.

credits constitute private property, establishing a solid legal position protected by existing national legal systems through property law, tort law and unjust enrichment.¹⁸²

The most defensible analytical solution to this debate lies in the conceptual framework of *instrumental property* proposed by Manea and the concept of *variable legal status* developed by Yliheljo. Manea's fundamental argument is that applying a general label of private property to carbon instruments is both doctrinally inadequate and analytically misleading. This is because the fundamental constituent elements of these rights—the scope of the right of use, the conditions for transfer, and the grounds on which the right may cease to exist—are entirely defined, limited and shaped by the public policy objectives of the regulatory regime in which the instrument arises.¹⁸³ An instrument is a form of property, but one that is constituted *instrumentally* — that is, for the purpose of achieving specific regulatory objectives. Consequently, its content is always open to evolution over time, in line with these objectives and the regulatory framework through which they are realised. Yliheljo's three-pronged analysis of the personal, temporal and spatial variability of EUA ownership provides a specific analytical framework through which this dynamic formation of legal content can be mapped. Rights attached to a carbon instrument cannot be determined in the abstract, but only by reference to the identity of the holder, the stage of the regulatory cycle, and the jurisdiction in which the law governing the specific transaction applies.¹⁸⁴

This framework—that is, instrumental property whose content is dynamically shaped—eliminates the dual flaw inherent in both conflicting views. In contrast to the *sui generis* school, this framework upholds the doctrinal view that carbon instruments constitute property rights that are transferable, can be used as security, and are protected in the event of insolvency, without requiring courts and legislators to abandon existing sources of property law. In contrast to the intangible property school, this framework captures the structural novelty of carbon instruments. It takes a protective approach to the fact that their legal content is not determined by general property law, but rather is created by the regulatory regime, and consequently, the content necessarily changes as the regime changes. The UNIDROIT Working Group has indirectly adopted this framework in the draft principles it prepared for verified carbon credits. While Draft Principle 3(1) confirms that VCCs may be the subject of property rights, Draft

¹⁸² Haut Comité Juridique de la Place Financière de Paris (n 27) 19-20; Streck and von Unger (n 20) 184, 188.

¹⁸³ Manea (n 72) 40-42, 55.

¹⁸⁴ Yliheljo (n 68) 51, 61-62.

Principle 3(4) upholds the primacy of applicable domestic law in determining the specific content of these rights. This is a formulation that, whilst acknowledging the instrument's property nature, refers to the variable legal content in terms of the jurisdiction envisaged by the instrumental property framework.¹⁸⁵

This thesis argues that the framework of instrumental property—developed through an analysis of variable legal status and validated by the principles set out by the UNIDROIT Working Group—offers the most consistent doctrinal explanation of currently existing carbon credits. The central contention here is that the governance of carbon instruments under private law cannot be achieved through the mechanical application of existing categories of property, financial instruments or administrative permits; rather, it requires an analytical framework that acknowledges the constitutive role of public regulatory law in defining the content of private rights. This is not merely the result of an academic observation. It has direct and practical implications for market participants, regulators and legislators who must navigate the fragmented legal landscape documented in this chapter. Until a harmonised private law framework at EU level or through the UNIDROIT process provides a stable and predictable legal foundation for carbon certificate governance, the systemic risks identified in this analysis will continue to hinder the development of efficient and high-integrity carbon markets capable of meeting the objectives of the Paris Agreement.

For this reason, it would not be unreasonable to argue that this structure—which retains the flexibility to adapt to variability and ongoing developments—represents the most logical and distinctive approach to carbon certificates in terms of private law and legal character.

The findings of this study extend beyond a doctrinal resolution of the classification debate. They highlight the structural characteristics of the governance of carbon instruments, which have profound practical implications for financial market regulation, taxation and international coordination. The absence of a harmonised private law framework for carbon certificates indicates that the treatment of these instruments under financial regulation—specifically within the scope of MiFID II, EMIR and the Market Abuse Regulation—operates on a legally uncertain footing. Regulatory authorities classify and supervise carbon instruments as financial instruments, commodities or unregulated credits depending on jurisdiction and the specific instrument in question; however, none of these regulatory classifications resolves—nor can

¹⁸⁵ UNIDROIT Working Group (n 107) 16-17, paras 57-61.

they resolve—the underlying private law uncertainty. It merely adds an additional layer of public regulatory characterisation. As Annunziata specifically noted in the context of MiFID II, the inclusion of EUAs within the scope of financial instruments “has not resolved the issue of their more precise characterisation under general private law” and has left the instrument’s true proprietary nature to fragmented national laws.¹⁸⁶ This insurmountable tension between regulatory classification and private law uncertainty constitutes the fundamental challenge for the financial regulation of carbon markets, and the analysis in Chapter 3 focuses on this challenge.

In the following sections, it will be examined that this uncertainty is not merely a doctrinal drawback, but a structural obstacle to the consistent regulation, taxation and international coordination of carbon markets. It is demonstrated that resolving this requires not only regulatory clarity, but also a principled reconceptualisation of the private law foundations upon which carbon market governance is based.

III. THE FINANCIAL REGULATION OF CARBON MARKETS

3.1. Introduction: The Financialisation of the Carbon Market

In the previous section, it was determined that carbon credits are subject to significant uncertainty under private law and serve as an instrumental property right whose content is dynamically shaped within the framework of public regulatory law specific to each jurisdiction. This uncertainty cannot result in carbon instruments remaining unregulated. Against this backdrop of an uncertain private law foundation, a dense and rapidly evolving financial market regulatory framework has been established to govern the trading, clearing, and supervision of carbon allowances and their derivatives. The main argument of this section is that this framework—primarily the Markets in Financial Instruments Directive (MiFID II), the European Market Infrastructure Regulation (EMIR), and the Market Abuse Regulation (MAR)—provides a form of public market discipline that private law alone cannot provide for carbon instruments but leaves the fundamental ownership issues identified in Chapter 2 largely unresolved. Consequently, financial regulation shapes the legal uncertainty surrounding carbon instruments without eliminating it.

¹⁸⁶ Annunziata (n 66) 699-700.

The implementation of this regulatory mechanism is a direct result of the carbon market's increasing financialisation. When the EU Emissions Trading System (EU ETS) was established in 2005, it was designed to create a purely environmental “cap-and-trade” mechanism aimed at fulfilling the European Union's Kyoto Protocol commitments by serving as a form of carbon pricing and incentivising emissions reductions. During its pilot phase, the market was narrowly focused on the spot trading of emission allowances among entities subject to compliance obligations.¹⁸⁷ However, over the next twenty years, the market underwent a profound structural transformation. As Wei and others have shown, the introduction of carbon derivatives shortly after the spot market opened—as carbon entered the financial mainstream of both compliance and voluntary markets—initiated a process in which futures contracts rapidly surpassed spot contracts, eventually accounting for over 90 percent of total trading volume.¹⁸⁸ This transformation from an environmental policy tool to a financial asset class is the defining characteristic of the modern carbon market and a prerequisite for the regulatory regimes examined in this section.

The financialisation of the EU Emissions Trading System is evident in the entry into the market of a wide variety of financial intermediaries, alongside industrial entities that have assumed compliance obligations. Investment banks, credit institutions, investment funds, and private trading firms have become an integral part of the market's functioning by providing access to smaller compliance entities, offering liquidity, reducing transaction costs, and narrowing the spread between bid and ask prices.¹⁸⁹ The dependence of compliance entities on these intermediaries is striking. Approximately 77 percent of allowances are purchased from banks and brokers in the secondary market rather than through primary auctions. This dependence can be attributed to the convenience and cost-effectiveness for industrial emission sources, as well as the limited expertise of industrial emitters regarding financial markets.¹⁹⁰ After emission allowance prices began a steady rise in 2017 and 2018, the market also attracted actors who

¹⁸⁷ Ping Wei and others, 'Financialisation of the European Union Emissions Trading System and its influencing factors in quantiles' (2025) 30(1) *International Journal of Finance & Economics* 925; Manea (n 72) 54, 62.

¹⁸⁸ Wei and others (n 187) 926; Spilker and Nugent (n 106) S109.

¹⁸⁹ Johanna Cludius, Hannah Galster, Sean Healy, Viktoria Noka and Long Lam, *The Role of Financial Operators in the ETS Market and the Incidence of Their Activities in Determining the Allowances' Price* (Study requested by the ITRE Committee, Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, PE 740.052, December 2022); IOSCO *Compliance Carbon Markets: Consultation Report* (IOSCO, 2023) 12.

¹⁹⁰ Liang Yang, *Global Compliance Carbon Markets: Structure Explained* (CFA Institute Research and Policy Center 2025) 4.

view carbon as a distinct alternative asset class. This includes hedge funds and speculative investors seeking portfolio diversification and arbitrage opportunities.¹⁹¹

These approaches by market participants are also reflected in the highly structured division of roles within the derivatives market. This situation is documented in detail by the position-level data published by ESMA under its supervisory authority. Non-financial compliance entities—industrial emitters, utilities, and airlines—typically hold long positions. The objective of such entities when entering into futures and forward contracts is to avoid exposure to future carbon prices and to secure the necessary allowances to cover their actual emissions.¹⁹² In contrast, financial intermediaries predominantly hold short positions. Acting as market makers, these institutions sell derivative contracts to compliance entities and frequently purchase physical spot allowances to offset these short positions. In this way, they serve as a bridge between primary auctions and the secondary futures market.¹⁹³ The financialisation of the market has reached its peak with the emergence of exchange-traded funds (ETFs), commodities, and bonds such as the KraneShares European Carbon Allowance Strategy ETF, WisdomTree Carbon ETC, and SparkChange Physical Carbon EUA ETC. These products have solidified carbon’s position as an investable asset class by purchasing and holding allowances on behalf of investors, while also giving rise to buy-and-hold strategies that regulators monitor for their impact on the supply of allowances available to compliance entities.¹⁹⁴

The extent of this financialisation is best illustrated by empirical data on the dominance of derivatives over spot trading. In 2021, out of the approximately 759 billion euros traded globally, 683 billion euros were transacted through futures under the EU Emissions Trading System (EU ETS), accounting for approximately 90 percent of the market value.¹⁹⁵ This dominance has continued. According to ESMA’s latest data, the total trading volume increased by 35% in 2024, reaching 13.7 billion metric tons of carbon dioxide equivalent across 4.7 million transactions. Futures account for approximately three-quarters of the trading volume.¹⁹⁶

¹⁹¹ Wei and others (n 187) s 2.1.1; Cludius and others (n 189) 52.

¹⁹² European Securities and Markets Authority, *EU Carbon Markets 2024* (ESMA50-43599798-10379, 7 October 2024) 11, 16; European Securities and Markets Authority, *Final Report: Emission Allowances and Associated Derivatives* (ESMA70-445-38, 28 March 2022) 113.

¹⁹³ ESMA, *EU Carbon Markets 2024* (n 192) 16; European Securities and Markets Authority, *Final Report on Emission Allowances and Associated Derivatives* (ESMA70-445-38, 28 March 2022) 113; Cludius and others (n 189) 25.

¹⁹⁴ ESMA, *Final Report* (n 193) 113-14; Yang (n 190) 4.

¹⁹⁵ Spilker and Nugent (n 106) S111.

¹⁹⁶ ESMA, *EU Carbon Markets 2025* (n 190) 4, 10.

The market has also become significantly concentrated. Approximately 89% of the allowances put up for auction are purchased by just ten participants. Most of these participants are financial intermediaries that subsequently transfer these allowances to compliance entities via the secondary market.¹⁹⁷ The number of daily derivatives position holders has also increased in parallel, rising from 783 in 2023 to an average of 909 in 2024. Among these, investment firms and credit institutions hold most gross positions. In recent periods, they have accounted for approximately 50 to 56 percent, whereas investment funds, despite having over 450 active participants, hold only about 6 percent of the market share.¹⁹⁸

This process of financialisation is a contentious one. In particular, the role of speculation has sparked an ongoing debate over whether financial actors are decoupling carbon prices from environmental fundamentals. According to one view, speculative capital flows do not threaten such a decoupling. Wei and others found that movements in the highest price brackets of the EU ETS were driven to a significant extent by external macroeconomic shocks—such as crude oil prices and general market risk aversion—rather than emission reduction fundamentals, Yliheljo, however, observes that the re-emergence of speculators has prompted policymakers to consider interventions—such as price caps—to prevent the market from being cornered.¹⁹⁹ According to another view, since entities subject to compliance obligations typically approach their compliance needs with a short-term perspective, long-term investors could help prices realign with fundamental indicators by anticipating future scarcity.²⁰⁰ Research conducted by both ESMA and the European Commission has concluded that fears of a speculative decoupling have been overstated to date. Investment funds associated with speculative behaviour hold a relatively small share of positions (less than 8 percent), and the price increases observed since 2018 can be attributed to fundamental policy reforms—such as the Market Stability Reserve and the “Fit for 55” package—rather than market manipulation or runaway speculation.²⁰¹

Consequently, today’s carbon market is a financial market both in substance and in form, and its integrity is ensured by the regulatory framework examined in this section. Market integrity is a lesson drawn from its own history. As Frunza documents, the early carbon market operated within a regulatory vacuum that exposed it to large-scale VAT carousel fraud, money

¹⁹⁷ *ibid* 9; Yang (n 190) 4.

¹⁹⁸ ESMA, *EU Carbon Markets 2025* (n 190) 14; ESMA, *EU Carbon Markets 2024* (n 192) 15.

¹⁹⁹ Wei and others (n 187) s 4; Yliheljo (n 68) 47.

²⁰⁰ Cludius and others (n 189) 27.

²⁰¹ European Commission, *Report on the Functioning of the European Carbon Market COM* (2022) 516 final, 26; ESMA, *Final Report* (n 193) 113.

laundering, and cyber theft from ledgers. This resulted in losses exceeding 5 billion euros and forced the Commission to suspend spot trading in 2011.²⁰² These events convinced the Commission that it was not possible to manage a trading system worth billions of euros solely through environmental regulations and that emission allowances needed to be brought under capital markets legislation. Although the financialisation of the market has raised broader issues related to systemic risk, this risk is currently considered limited. As noted by the Haut Comité Juridique de la Place Financière de Paris, the risk associated with carbon credit derivatives is far from systemic, given the market's small size. However, it must be managed before reaching that threshold.²⁰³ The three main regimes examined in this section should be understood as against this backdrop. The analysis should first focus on MiFID II, then EMIR, and finally the Market Abuse Regulation.

3.2. MiFID II and the Financial Regulation of Carbon Allowances

3.2.1. The Extension of MiFID II to Spot Allowances

The key regulatory measure addressing the market integrity issues outlined above was the inclusion of spot emission allowances within the framework of EU financial market legislation. Under the original Markets in Financial Instruments Directive (MiFID I), the regulatory scope of the carbon market was highly fragmented. While the Directive covered emission allowances only when they served as the underlying asset of a derivative contract, the spot segment—that is, the trading of emission allowances for immediate delivery—was entirely excluded from European financial oversight.²⁰⁴ Consequently, secondary spot trading took place either bilaterally over-the-counter or on unregulated spot exchanges, without any harmonised customer due diligence or supervisory oversight.²⁰⁵ This regulatory gap was a structural loophole exploited by fraud cases between 2009 and 2011.

MiFID II, which entered into force on 3 January 2018, filled this gap by classifying spot emission allowances as financial instruments in their own right. This mechanism involved the addition of a new category to the list of financial instruments. Annex I, Section C, Article 11

²⁰² Marius-Christian Frunza, *Fraud and Carbon Markets: The Carbon Connection* (Routledge 2013) xi, 62, 66-69; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 112, 114.

²⁰³ Haut Comité Juridique de la Place Financière de Paris (n 27) 31.

²⁰⁴ Directive 2004/39/EC of the European Parliament and of the Council of 21 April 2004 on markets in financial instruments [2004] OJ L145/1 (MiFID I); Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 136.

²⁰⁵ Bo Chen and Rui Wu, 'Legal and Policy Pathways of Carbon Finance: Comparative Analysis of the Carbon Market in the EU and China' (2023) 24(1) *European Business Organization Law Review* 41, 58-59.

now covers all emission allowances consisting of units deemed compliant with the requirements of the EU ETS Directive, thereby uniformly incorporating both spot and derivative contracts in the secondary market into the scope of EU financial law.²⁰⁶ The Commission's decision to revise the framework stemmed from three specific incidents in 2009 and 2010 that highlighted the scope of risks associated with the unregulated spot market. VAT carousel fraud exploiting the absence of "know your customer" rules in spot exchanges, the controversial resale of Certified Emission Reductions (CERs) returned by the Hungarian government in 2010, and a wave of cyber theft of emission allowances—including the hacking of a Romanian account in late 2010 that led to the theft of 1.6 million emission allowances—can be cited as the three main causes.²⁰⁷

The rationale behind this classification was, of course, to strengthen the integrity of the carbon market's segments and ensure their efficient operation. By eliminating the artificial distinction between spot and derivative contracts, the classification reinforced continuous oversight. By bringing the spot market under the scope of the Market Abuse Regulation and the Market Abuse Directive, a legal basis was established to deter and penalise insider trading and market manipulation, and it became mandatory for trading platforms that previously offered only spot contracts to be authorised as a regulated market, a multilateral trading facility, or an organised trading facility.²⁰⁸ The Commission clearly outlined the practical and implementation-focused purpose of this step in the 2015 *Report on the Functioning of the European Carbon Market*, stating that classifying emission allowances as financial instruments would make customer due diligence checks mandatory for MiFID-licensed traders in the secondary spot market. This move is a measure aimed at closing loopholes that permit money laundering and the disposal of stolen emission allowances.²⁰⁹ However, as noted in Section 2, this classification is functional rather than doctrinal. It subjects emission allowances to a financial regulatory regime without resolving their private law status, and the determination of this status has been left to the differing laws of member states by the Court of Justice and the EU legislature in the *ArcelorMittal* case.²¹⁰

²⁰⁶ Directive 2014/65/EU (n 62) Annex I, Section C, point 11.

²⁰⁷ European Commission, Memo/11/719.

²⁰⁸ Directive 2014/65/EU (n 62) recital 11; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 174-76.

²⁰⁹ European Commission, *Report on the Functioning of the European Carbon Market* COM (2015) 576 final, 24.

²¹⁰ See Chapter 2, sections 2.2.2 and 2.2.6.

3.2.2. Scope and Exemptions

The classification of allowances as financial instruments brings any entity whose primary activity is providing investment services to third parties or trading on its own account on a professional basis within the scope of MiFID II. Such firms are required to obtain prior authorisation from the national competent authority, and authorised firms are subject to all provisions of the MiFID II conduct of business rules. These include obligations to act honestly, fairly, and professionally; assess the suitability of products for clients; ensure best execution; and implement product governance requirements that ensure carbon instruments are distributed only to designated target markets.²¹¹

Since applying these obligations to industrial emission sources would undermine the economic effectiveness of the EU Emissions Trading System (EU ETS), the directive establishes a specially designed, two-tiered structure that includes two key exceptions. First, pursuant to Article 2(1)(e), it exempts operators subject to compliance obligations under the EU ETS Directive who do not execute client orders when trading emission allowances and do not provide any investment services other than trading on their own account, provided they do not employ high-frequency algorithmic trading techniques.²¹² As Annunziata notes, this exemption is justified on the grounds that the relevant activity's impact is confined to the firm's internal operations rather than targeting a broader market. An industrial operator that executes trades on behalf of clients or uses high-frequency algorithmic trading immediately loses its exemption.²¹³

The second exception under Article 2(1)(j) applies to non-financial businesses such as energy service providers and commodity traders, and exempts individuals who trade on their own account or provide investment services to their clients or suppliers, provided that the activity is ancillary to their main business on a group basis, the main business is not investment services or banking, they do not use high-frequency algorithmic trading techniques, and they annually notify the competent authority of their use of the exemption.²¹⁴ The test to determine whether an activity is truly ancillary was initially a highly complex, three-stage quantitative assessment under Delegated Regulation (EU) 2017/592; however, this complexity was simplified as part

²¹¹ Directive 2014/65/EU (n 62) Title II, Chapter I, and arts 24, 25, 27; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 137, 141; Yliheljo (n 68) 71.

²¹² Directive 2014/65/EU (n 62) art 2(1)(e); Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 137.

²¹³ Filippo Annunziata, 'Can Finance Help Save the Planet? The Case of Emission Allowances and MiFID II' (Bocconi Legal Studies Research Paper No 3539568, 2020) 11; Annunziata (n 66) 711.

²¹⁴ Directive 2014/65/EU (n 62) art 2(1)(j); Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 138.

of the post-pandemic capital markets recovery package through MiFID “Quick Fix” Directive 2021/338.²¹⁵

These exemptions were deliberately designed to divide the carbon market into two regulatory tiers, imposing the heavy compliance obligations of MiFID II on investment firms and market makers trading for profit, while protecting industrial operators who trade solely to meet their environmental obligations and pose a lower risk of market manipulation.²¹⁶ However, the practical implementation of this regulation has been subject to constant criticism. Annunziata notes that when exemptions are combined with the optional Member State exemptions available under Article 3, they create an excessively complex landscape comprising four distinct regulatory regimes: full implementation, full EU exemption, partial EU exemption, and national exemption.²¹⁷ Przybojewska and Pyka go even further, arguing that since exemptions depend on the nature of the transaction rather than the entity’s status, a single issuer could be fully exempt when acting on its own account, partially exempt when acting as a hedging instrument for its corporate group, and fully subject to regulation when executing third-party orders. This leads to a significant fragmentation of the EU regime, substantially complicating the compliance process for corporate groups in the energy sector.²¹⁸ This fragmentation at the level of financial regulation further complicates the fragmentation in the area of private law identified in Chapter 2 and confirms that building financial regulations on an uncertain foundation of private law exacerbates the problem rather than resolving it.

3.2.3. Transparency, Reporting, and Position Management

MiFID II and the accompanying Markets in Financial Instruments Regulation (MiFIR) introduce a strict regime of transparency, reporting, and position management for emission allowances and their derivatives. Regarding position reporting, Article 58 of MiFID II requires trading venues to publish a weekly report aggregating the positions held by different categories of participants, such as investment firms, investment funds, other financial institutions, commercial entities, and compliance operators. This report must specify long and short positions, changes from the previous report, and the percentage of total open positions.

²¹⁵ Ilona Przybojewska and Michał Pyka, 'EU carbon emission allowances as environmental and financial instruments — is it possible to kill two birds with one stone?' (2024) 42(1) *Journal of Energy & Natural Resources Law* 1, 11-12.

²¹⁶ Ylheljo (n 68) 71; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 139.

²¹⁷ Annunziata (n 66) 712-13; Directive 2014/65/EU (n 62) art 3.

²¹⁸ Przybojewska and Pyka (n 215) 13-14.

Additionally, it requires the submission of a full daily breakdown of all positions held on the platform to the competent authority and ESMA.²¹⁹ This regime has recently been amended by Directive (EU) 2024/790. This directive requires platforms where options are traded to publish two weekly reports—one consolidated and the other excluding options—and shifts the position reporting under Article 58 from spot allocations to derivatives.²²⁰

The most significant recent development concerns the distinction between position limits and position management controls. The strict statutory position limits under Article 57 of MiFID II do not apply to emission allowances or their derivatives. ESMA concluded that imposing such limits could restrict the ability of financial intermediaries and compliance operators to provide the liquidity needed to hedge against carbon price risk.²²¹ The EU has opted for position management controls rather than strict limits. This required a targeted legislative amendment because emission allowance derivatives are not classified as “commodity derivatives” under MiFID II. Consequently, position management controls applicable to commodity derivatives did not automatically apply to them.²²² Consequently, in its 2022 Final Report, ESMA proposed amending Article 57(8) to bring emission allowance derivatives under the position management control regime. This will strengthen market oversight by requiring trading platforms to establish accountability levels and assess the nature and purpose of large positions.²²³ The recommendation in question was implemented by Directive (EU) 2024/790, which officially amended Article 57(8) to include emission allowance derivatives within its scope and granted trading platforms the authority to monitor open positions, request information on the size and purpose of positions as well as their beneficial owners, and request the reduction of any position that threatens orderly trading.²²⁴ ESMA’s Final Report on implementing technical standards, dated December 2024, states that platforms will be required to establish predefined accountability levels for emission allowance derivatives; a breach of these levels will trigger an

²¹⁹ Directive 2014/65/EU (n 62) art 58(1); Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 142.

²²⁰ Directive (EU) 2024/790 of the European Parliament and of the Council of 28 February 2024 amending Directive 2014/65/EU [2024] OJ L, 2024/790, 215; European Securities and Markets Authority, *Final Report on the Amendments to Certain Technical Standards for Commodity Derivatives* (ESMA74-2134169708-7577, 16 December 2024) 6, 20.

²²¹ ESMA, *Final Report* (n 193) paras 422-28, 132-33.

²²² *ibid* para 350.

²²³ *ibid* paras 348-53, 115-16.

²²⁴ Directive (EU) 2024/790 (n 220) art 57(8), 214.

investigation into the economic rationale of the position; and these rules have taken effect as of 29 September 2025.²²⁵

With regard to trade transparency, MiFIR requires trading venues to publish current bid and ask prices and the depth of trading interest prior to a trade, and to disclose the price, volume, and time of executed trades to the public in real time to the extent technically feasible, and in any event no later than fifteen minutes after the trade is executed.²²⁶ Finally, pursuant to Article 26 of MiFIR, investment firms are required to report all details of their transactions in financial instruments to the competent authority by the close of the next business day at the latest. This obligation covers instruments traded on a trading platform as well as economically equivalent over-the-counter derivatives and enables ESMA and the competent authorities to reconstruct the transaction chain for the purpose of detecting market abuse and money laundering.²²⁷

3.2.4. Supervisory Architecture and Its Gaps

Under MiFID II and the Market Abuse Regulation, the supervision of the carbon market is a shared and multi-layered responsibility. The primary enforcers are the national competent authorities of the Member States. They receive reports of suspicious transactions and orders, conduct investigations, and exercise the authority to freeze assets, suspend trading, and impose financial or criminal sanctions for market abuse.²²⁸ ESMA acts as the European coordinator and standard-setter by centralising transaction data reported under MiFIR and EMIR and promoting supervisory convergence, but relies on national authorities to prosecute manipulative behaviour.²²⁹ Since emission allowances are traded across different jurisdictions and are closely linked to the wholesale energy market, the Market Abuse Regulation requires national authorities to cooperate with one another and with ESMA, exchange information without delay, and provide mutual assistance; given the intersection between the Market Abuse Regulation

²²⁵ ESMA, *Final Report on the Amendments to Certain Technical Standards for Commodity Derivatives* (16 December 2024) 3, 6, 8, 17-18; Commission Delegated Regulation (EU) 2022/1299 [2022] OJ L197/4.

²²⁶ Regulation (EU) No 600/2014 of the European Parliament and of the Council of 15 May 2014 on markets in financial instruments [2014] OJ L173/84 (MiFIR), arts 8-11; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 142-43.

²²⁷ MiFIR (n 226) art 26; ESMA, *Final Report* (n 193) 50, 123.

²²⁸ ESMA, *Final Report* (n 193) 28-34, paras 107-29, 150.

²²⁹ European Commission, *Report on the Functioning of the European Carbon Market COM* (2022) 516 final, 27; ESMA, *Final Report* (n 193) para 442, 135.

and the Regulation on the Integrity and Transparency of the Energy Market (REMIT), it requires them to coordinate with national energy regulators.²³⁰

However, ESMA and the academic literature have identified several structural weaknesses in this regulatory framework. The first of these is the lack of transparency in the over-the-counter spot market. Since the reporting obligation for transactions under MiFIR applies only to instruments traded on a trading venue, and given that OTC contracts have very short maturities and do not carry the same identification number as contracts traded on venues, such transactions fall outside the reporting obligation and create a blind spot in secondary market oversight.²³¹ Second, there is a series of deduplication issues. In cases where investment firms aggregate client orders, the resulting regulatory reports often fail to correctly attribute transactions to their actual owners, making it difficult for ESMA to reconstruct the transaction chain and distinguish between its own transactions and those of its clients.²³²

Third, there is no central market surveillance authority for the carbon market. ESMA has examined the possibility of consolidating primary market, secondary market, and registry data into a single European database that can be queried using monitoring software specifically developed for this purpose. However, it concluded that the cost and complexity of such an institution, along with the legal changes it would require, have so far prevented its establishment, leaving a fragmented framework where jurisdictions overlap.²³³ Fourth, there is the problem of the absence of uniform Legal Entity Identifiers (LEIs) in the Union Registry. This prevents regulators from automatically linking an operator's physical emission allowances to its derivatives trading activities. ESMA's latest report notes that progress has been limited, with only 16% of new account holders registering such an identifier code in the previous year.²³⁴

3.2.5. The Classification Problem: Spot Allowances versus Derivatives

A constant source of legal challenges, however, concerns the distinction between spot emission allowances and emission allowance derivatives. According to Annex I, Section C of MiFID II, emission allowances fall under Article C(11), while options, futures, swaps, forward contracts,

²³⁰ ESMA, *Final Report (n 193)* paras 56, 149; Annunziata (n 66) 703.

²³¹ ESMA, *Final Report (n 193)* paras 386-88, 123-24; Cludius and others (n 189) 45-46.

²³² ESMA, *EU Carbon Markets 2024 (n 192)* 4, 16; Cludius and others (n 189) 46.

²³³ ESMA, *Final Report (n 193)* paras 440-53, 135-36; Cludius and others (n 189) 45-46.

²³⁴ ESMA, *Final Report (n 193)* 105, para 316; ESMA, *EU Carbon Markets 2025 (n 190)* 4.

and all other derivative contracts related to emission allowances fall under Article C(4).²³⁵ The practical difficulty lies in the absence of a definition in EU financial law that distinguishes a spot emission allowance from a very short-term derivative. Delegated Regulation (EU) 2017/565 defines a spot contract in the context of commodities. However, emission allowances are not classified as commodities. As a result, the commodity-specific definition does not apply, and participants are left to rely solely on the directive's general provisions to determine the scope of contracts with very short delivery periods.²³⁶

The absence of a clear legal definition has led to significant reporting discrepancies among Europe's leading carbon trading platforms regarding contracts with delivery periods of up to two days. EEX treats such short-term instruments as spot contracts, classifies them as "spot (daily maturity)," and reports them under the C(11) emissions allowances category. In contrast, ICE Endex and Nasdaq Oslo classify nearly the same instruments as "daily futures" and report them under the C(4) derivatives category. This discrepancy was documented by ESMA in Table 10 of the 2022 Final Report.²³⁷ Although only a small portion of transactions on exchanges fall into this ambiguous category, ESMA has identified this discrepancy as a threat to equal competitive conditions among exchanges and has called for legal clarification. In this context, it has recommended that the Commission provides guidance in the short term to establish a clear boundary between the two categories and that Level 2 measures be formally amended in the medium term.²³⁸ The situation becomes even more complex when it comes to foreign compliance markets. In its commentary dated 24 June 2024, ESMA confirmed that the C(11) spot classification is limited to units legally recognised under the EU ETS, whereas the broader C(4) derivatives classification also covers derivatives related to any emission allowance. As a result, derivatives related to non-EU compliance units—such as UK emission allowances under the UK ETS following Brexit—are classified as C(4) financial instruments.²³⁹ Underlying all these challenges is a critical and often misunderstood point: while the carbon market behaves economically like a commodity market, emission allowance derivatives are not classified as commodity derivatives under MiFID II but fall into distinct legal categories of their own. As

²³⁵ Directive 2014/65/EU (n 62) Annex I, Section C, points 4 and 11.

²³⁶ Commission Delegated Regulation (EU) 2017/565 [2017] OJ L87/1, arts 7(2) and 10(2).

²³⁷ ESMA, *Final Report* (n 193) Table 10, 125.

²³⁸ *ibid* paras 392-94, 123.

²³⁹ ESMA, *Questions and Answers on MiFID II and MiFIR commodity derivatives topics* (interpretation of 24 June 2024).

noted above, this classification distinction requires the targeted legal intervention of Directive (EU) 2024/790 to extend position management controls to these instruments.²⁴⁰

3.2.6. The Exclusion of Voluntary Carbon Credits

Voluntary carbon credits, which stand in stark contrast to compliance credits, fall outside the scope of MiFID II. Since Annex I, Section C(11) is limited to units recognised solely for compliance with the EU ETS Directive, and since VCCs are created by private credit programs such as Verra and the Gold Standard to meet corporate sustainability goals rather than legal compliance obligations, they cannot be classified as C(11) financial instruments. Furthermore, according to the European regulatory authority's view, since they are not physically deliverable, fungible commodities such as agricultural products or energy, they do not qualify as commodities under Delegated Regulation (EU) 2017/565.²⁴¹ The implications of this exclusion are far-reaching. MiFID authorisation is not required for spot VCC trading platforms to operate, and spot VCC transactions fall outside the scope of the Market Abuse Regulation. As a result—as noted by IOSCO—oversight of the voluntary spot market is generally limited to anti-fraud and anti-manipulation practices based on reports and complaints rather than continuous regulatory supervision, and the market is exposed to risks of greenwashing, double-counting, and inadequate price discovery.²⁴²

The legal treatment of VCC derivatives is less clear. The HCJP states that, since VCCs do not have legal emission rights, derivatives based on them cannot fall under category C(4), but they can be classified as financial instruments under the general category C(10) for derivatives related to other underlying assets. Whether they fall into this category depends largely on the concept of fungibility, and since VCCs possess highly individualised characteristics determined by project, geography, and year of production, they lack the standardised fungibility typical of financial underlying assets. This makes it legally challenging to classify their derivatives in a uniform manner.²⁴³ In light of this fragmentation, IOSCO has explicitly rejected proposing a uniform global classification, instead encouraging national authorities to clarify the treatment of carbon credits within their own jurisdictions. It has referred the underlying private law issues

²⁴⁰ *ibid* para 350; ESMA, *Final Report on the Amendments to Certain Technical Standards for Commodity Derivatives* (n 225).

²⁴¹ Haut Comité Juridique de la Place Financière de Paris (n 27) 25, 27, 29; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 138.

²⁴² IOSCO, *Voluntary Carbon Markets Consultation Report* (IOSCO CR06/2023, December 2023) 60.

²⁴³ Haut Comité Juridique de la Place Financière de Paris (n 27) 25, 29.

to the UNIDROIT/UNCITRAL Joint Study and recommended that jurisdictions seek regulatory outcomes—such as investor protection and market integrity consistent with traditional financial markets—by adapting existing frameworks, such as the Principles for Commodity Derivatives, where appropriate.²⁴⁴

The situation in the United States, however, is distinctly more interventionist in nature. On 15 October 2024, the Commodity Futures Trading Commission published its final guidance regarding the listing of voluntary carbon credit derivative contracts on exchanges. In this guidance, VCCs are treated as underlying commodities, and in accordance with the fundamental principle of preventing manipulation, designated contract markets are required to ensure that the underlying credits meet high integrity standards, such as being genuine, additional, permanent, and free from double counting.²⁴⁵ A number of emerging market jurisdictions have similarly addressed the uncertainty in Europe through direct legislation. For example, while the Egyptian Financial Regulatory Authority recognises carbon credits in financial records as either financial instruments or intangible assets, the Abu Dhabi Global Market regulates carbon credits as environmental instruments subject to financial oversight.²⁴⁶

This asymmetry between the comprehensive financial regulation of compliance permits and the near-total absence of financial regulation in the voluntary market constitutes one of the fundamental regulatory gaps in the carbon market, and this issue is examined in greater detail in Section 3.5 below, where regulatory differences are discussed.

3.3. EMIR and the Regulation of Carbon Derivatives

While MiFID II regulates the classification and trading of emission allowances in both spot and derivatives markets, the European Market Infrastructure Regulation (EMIR) addresses only the specific risks arising from derivatives contracts. EMIR was enacted following the 2008 financial crisis to reduce systematic counterparty credit risk in the over-the-counter derivatives market, and its application to carbon derivatives stems directly from their classification as financial instruments. Since EMIR's definition of derivative contracts includes the financial instruments listed in Section C(4) of Annex I to MiFID II (options, futures, swaps, and other

²⁴⁴ IOSCO, *Good Practices for Voluntary Carbon Markets* (n 137) 8, 31-32.

²⁴⁵ US Commodity Futures Trading Commission, *Commission Guidance Regarding the Listing of Voluntary Carbon Credit Derivative Contracts* (Federal Register, 15 October 2024) 83380, 83386, 83396.

²⁴⁶ IOSCO, *Good Practices for Voluntary Carbon Markets* (n 137) 51-52; Haut Comité Juridique de la Place Financière de Paris (n 27) 25.

derivative contracts relating to emission allowances), carbon derivatives automatically fall within the regulation's mandatory scope.²⁴⁷

3.3.1. The Scope of EMIR and the Exclusion of Spot Allowances

An important practical limitation is that EMIR does not apply to the spot carbon market. Although MiFID II has elevated spot emission allowances to the status of financial instruments under Section C(11), EMIR's definition of a derivative contract excludes spot transactions. Therefore—as is the case with the Market Abuse Regulation discussed below—EMIR does not cover the spot market for emission allowances.²⁴⁸ This is also confirmed by the mapping of ESMA's supervisory data sources. This mapping reveals that EMIR reporting under Article 9 applies only to emission allowance derivatives traded on exchanges and over-the-counter, while spot transactions are subject to MiFIR transaction reporting.²⁴⁹ Consequently, the supervisory framework is split into two. In this scenario, the same underlying instrument is subject to different reporting regimes depending on whether it is traded as a spot or a derivative.

3.3.2. The Three Core Obligations: Clearing, Margin, and Reporting

EMIR has introduced three key obligations designed to enhance transparency and reduce counterparty credit risk for carbon derivatives. The first of these is the clearing obligation under Article 4. Under this requirement, standardised over-the-counter (OTC) derivative contracts must be cleared through an authorised central counterparty (CCP) that assumes the role of buyer for each seller and seller for each buyer.²⁵⁰ The second is the risk mitigation and collateral requirements under Article 11. These requirements apply to non-centrally cleared OTC carbon derivatives and require counterparties to measure their risks on a daily basis and engage in bilateral collateral exchanges in the form of initial and variation margins.²⁵¹ The third is the transaction reporting obligation under Article 9. This obligation requires all counterparties to report the conclusion, modification, and termination of derivative contracts to an authorised

²⁴⁷ Regulation (EU) No 648/2012 of the European Parliament and of the Council of 4 July 2012 on OTC derivatives, central counterparties and trade repositories [2012] OJ L201/1 (EMIR), art 2(5); Directive 2014/65/EU (n 62) Annex I, Section C, point 4.

²⁴⁸ Cludius and others (n 189) 19-20.

²⁴⁹ ESMA, *Final Report* (n 193) 51, para 188, Table 3.

²⁵⁰ EMIR (n 247) art 4; Cludius and others (n 189) 19-20.

²⁵¹ EMIR (n 247) art 11.

trade repository. This repository then makes the data available to ESMA and national competent authorities for the purpose of monitoring systemic risk.²⁵²

3.3.3. Counterparty Classification and the Hedging Exemption

The regulatory burden under EMIR is calibrated according to a participant's systemic risk profile through a distinction between financial counterparties (investment firms, credit institutions, and investment funds) and non-financial counterparties, which include industrial compliance entities and commercial enterprises that constitute the demand side of the carbon market.²⁵³ This distinction is of vital importance for compliance entities. This is because EMIR applies a clearing threshold mechanism that exempts bona fide hedging transactions. If a non-financial entity uses carbon derivatives to hedge commercial risks or to meet actual EU ETS compliance obligations, these positions are not included in the clearing threshold, and the entity retains its non-financial counterparty (NFC-) status below the threshold, which is exempt from clearing obligations and bilateral collateral requirements.²⁵⁴ Only if a non-financial entity engages in speculative trading such that its non-hedging positions exceed the gross notional threshold it is reclassified as a non-financial counterparty above the threshold (NFC+), at which point it becomes subject to the same clearing and collateral obligations as a financial counterparty.²⁵⁵ This mechanism reflects the two-tiered logic established in MiFID II exemptions at the derivatives regulation level. While bona fide environmental hedging activities conducted by industrial operators are protected, speculative financial activities are fully regulated.

3.3.4. Central Counterparties and the Clearing Infrastructure

In practice, the clearing of carbon derivatives is concentrated in a small number of specialised clearing houses. European Commodity Clearing clears transactions conducted on the European Energy Exchange; ICE Clear Europe clears a large portion of the European Union Emissions Trading System (EU ETS) futures traded on the Intercontinental Exchange; and Nasdaq Commodities Central Clearing clears derivatives traded on Nasdaq Oslo.²⁵⁶ As noted by

²⁵² *ibid* art 9; Cludius and others (n 189) 19-20.

²⁵³ EMIR (n 247) art 2(8)-(9); ESMA, *EU Carbon Markets 2025* (n 190) 13, 17.

²⁵⁴ EMIR (n 247) art 10.

²⁵⁵ *ibid*.

²⁵⁶ IOSCO, *Good Practices for Voluntary Carbon Markets* (n 137) 23; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 40.

IOSCO, these central clearing and settlement services play a critical role in reducing counterparty risk, ensuring transparency, and providing financial security. This is because the central counterparty (CCP) holds the collateral and offsets opposing positions in the market. Thus, it prevents the default of a single large trader from triggering a chain of defaults.²⁵⁷ Additionally, it is noteworthy that under the Settlement Finality Directive, physical allocations themselves may be pledged as collateral and accepted as valid collateral by clearing and payment systems. This links the private law analysis of the ownership of allowances examined in Chapter 2 to their collateral functions within the financial infrastructure.²⁵⁸ The dominance of central clearing is also confirmed by data. ESMA has determined that, on average, more than 85% of the notional value of emission allowance derivatives is traded as exchange-traded derivatives settled primarily through the exchange's central counterparty (CCP), while bilateral over-the-counter derivatives remain a minority in the market.²⁵⁹

However, the regulatory value of EMIR reporting is diminished due to the same deduplication issue that also affects MiFIR reporting. Since EMIR, MiFIR, and REMIT use inconsistent definitions and overlapping scopes, market participants often report the same carbon derivative under multiple regulatory frameworks. Under EMIR, if both the client and the clearing member are established in the EEA, both must report the same transaction independently, and aggregating client orders into block trades will disrupt the data chain. This makes it difficult for supervisors to link market-side execution with client-side allocation.²⁶⁰ ESMA is therefore required to implement complex dechaining procedures to distinguish actual end-client activities and has proposed the use of a unique identifier for grouped orders to resolve the issue.²⁶¹ EMIR REFIT introduced targeted reforms to alleviate this burden, exempting certain intra-group derivative contracts from reporting obligations, and ensured the harmonisation of data formats across the EMIR, MiFIR, and REMIT regimes so that participants can report the same

²⁵⁷ IOSCO, *Good Practices for Voluntary Carbon Markets* (n 137) 23.

²⁵⁸ Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems [1998] OJ L166/45, art 2(m); Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 24.

²⁵⁹ ESMA, *Final Report* (n 193) 58, para 216.

²⁶⁰ ESMA, *EU Carbon Markets 2024* (n 192) 16; ESMA, *Final Report* (n 193) paras 386-88, 123-24.

²⁶¹ ESMA, *EU Carbon Markets 2024* (n 192) 4, 16.

information in the same manner regardless of the regime under which their reporting obligations fall.²⁶²

3.3.5. Voluntary Carbon Credit Derivatives and the Regulatory Gap

The status of voluntary carbon credit derivatives under EMIR is characterised by legal uncertainty. Since voluntary carbon credits (VCCs) cannot be classified under Section C(11), their derivatives may fall within the scope of EMIR only if they are classified as financial instruments under Section C(10), which is a general provision covering derivatives related to commodities or other underlying assets. Whether they fall within this scope also depends on the issue of fungibility. As noted by the HCJP, within the meaning of Delegated Regulation (EU) 2017/565, a commodity must be a deliverable, fungible good. However, VCCs possess highly individualised characteristics defined by the project, geography, year of production, and certifying body. As a result, over-the-counter derivatives may be entirely exempt from the C(10) classification and, consequently, from EMIR.²⁶³ This uncertainty creates the same three-pronged regulatory gap identified throughout this section: in the absence of an EMIR classification, VCC derivatives are not subject to mandatory clearing obligations, counterparties to bilateral VCC derivatives are not required to exchange initial and variation margin, and transactions evade mandatory reporting obligations to trade repositories. This also prevents regulators from having visibility into the market's size and systemic interconnections.²⁶⁴

The market has sought to fill this gap through standardisation efforts led by the private sector. Commodity exchanges have developed standardised futures contracts with physical delivery. The most prominent of these are the CME Group's Global Emissions Offset (GEO), Nature-Based Global Emissions Offset (N-GEO) and Core Global Emissions Offset (C-GEO) contracts. These contracts eliminate the heterogeneity of underlying credits by permitting delivery only from approved high-integrity registries and are voluntarily cleared through relevant central counterparties (CCPs).²⁶⁵ In the over-the-counter market, the International Swaps and Derivatives Association (ISDA) has provided a standardised legal framework

²⁶² Regulation (EU) 2019/834 of the European Parliament and of the Council of 20 May 2019 amending Regulation (EU) No 648/2012 [2019] OJ L141/42 (EMIR REFIT), art 1(7); ESMA, *Response to the EC Commodity Derivatives Review* (ESMA74-2134169708-7942, 2 May 2025) paras 96-97.

²⁶³ Haut Comité Juridique de la Place Financière de Paris (n 27) 25, 29; Commission Delegated Regulation (EU) 2017/565 (n 236) art 7(2).

²⁶⁴ Haut Comité Juridique de la Place Financière de Paris (n 27) 26-29.

²⁶⁵ US Commodity Futures Trading Commission (n 245) 83386; Spilker and Nugent (n 106) S109-S110.

through the Verified Carbon Credit Transaction Definitions, first published in December 2022 and updated to a second version in February 2024. These definitions provide the first globally standardised framework for physically settled VCC transactions, including the principle of payment after delivery the allocation of risk in the event of cancellation of the credit after delivery, and procedures for transfer, cancellation and settlement disruption.²⁶⁶ Although these specific regulatory mechanisms help to reduce the regulatory gaps created by the underlying legal uncertainty, they cannot eliminate them entirely. Voluntary central clearing and contract-based standardisation cannot fully replace the mandatory clearing, collateralisation and reporting obligations that would apply if VCC derivatives were explicitly covered by EMIR.

3.4. The Market Abuse Regulation and Carbon Markets

The third pillar of the financial regulation of carbon markets is the Market Abuse Regulation (MAR). The application of MAR to emission allowances arose automatically because these allowances are classified as financial instruments under MiFID II. From 3 January 2018, the entire carbon market has been subject to prohibitions on insider dealing, unlawful disclosure of information and market manipulation. As clearly stated in Recital 37 of MAR, the regulation is designed to provide a single set of rules covering the entire primary and secondary markets for emission allowances.²⁶⁷

3.4.1. Scope: A Single Rulebook for Primary and Secondary Markets

The scope of the MAR in the carbon market has been deliberately kept broad. Pursuant to Article 2(1), this Regulation applies not only to spot emission allowances and their derivatives, but also to conduct and transactions, including bids relating to the auctioning of emission allowances on an authorised auction platform. This applies even if the products put up for auction are not themselves financial instruments.²⁶⁸ The main exception relates to public authorities. Pursuant to Article 6(3) and Recital 21, market transactions by Member States, the European Commission and other officially designated bodies are exempt from MAR provided they are carried out for the purpose of implementing the Union's climate policy. This exemption is based on the recognition that deliberate regulatory interventions, such as the operation of the

²⁶⁶ World Bank (n 113) Endnote 99; *ISDA Verified Carbon Credit Transactions Definitions, Version 2* (ISDA, February 2024).

²⁶⁷ Regulation (EU) No 596/2014 (n 63) recital 37.

²⁶⁸ Regulation (EU) No 596/2014 (n 63) art 2(1); Annunziata (n 66) 704; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 148.

Market Stability Reserve, as examined in Chapter 2, constitute structural features of the market rather than market manipulation.²⁶⁹

3.4.2. Inside Information and the EAMP Disclosure Regime

As there is no institutional issuer of emission allowances, the standard definition of inside information cannot be directly applied to the carbon market. Article 7(1)(c) of the MAR therefore provides a specific definition. Under this definition, the core framework will be constituted by information that is directly or indirectly related to emission allowances, has not been made public, is of a precise nature, and is likely to have a significant impact on the prices of emission allowances or related derivative products if made public.²⁷⁰ As Annunziata also notes, the definition makes no reference to an issuer. Inside information in the carbon market is instead linked to macro-policy decisions, trading positions and the physical operations of major emitting installations.²⁷¹ The content of the definition has been shaped by the Court of Justice's general case law on market abuse, which applies equally to allowances. In the *Geltl* case, the Court ruled that intermediate steps in a protracted process—such as the phased decision-making process prior to a facility's closure—could in themselves constitute precise inside information; in the *Lafonta* case, it ruled that information could be precise even where it did not indicate the direction in which the price would move.²⁷²

The Regulation combines this definition with an information regime appropriate to the industrial structure of the market. An emissions allowance market participant (EAMP) — defined in Article 3(20) as any person who trades in or places orders for emission allowances or their derivatives — is required, pursuant to Article 17(2), to disclose inside information relating to their physical operations to the public in a clear, effective and timely manner. The German regulatory authority BaFin has clarified that this covers events such as unplanned outages, partial or complete shutdowns of facilities, fuel switching and partial grounding of fleets in aviation.²⁷³ However, it is crucial that this obligation has a *de minimis* threshold. Under the Commission Delegated Regulation (EU) 2016/522, EAMPs whose total emissions or

²⁶⁹ Regulation (EU) No 596/2014 (n 63) art 6(3), recital 21; Annunziata (n 66) 703-04; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 33.

²⁷⁰ Regulation (EU) No 596/2014 (n 63) art 7(1)(c); Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 33.

²⁷¹ Annunziata (n 66) 705.

²⁷² Case C-19/11 *Markus Geltl v Daimler AG* ECLI:EU:C:2012:397, para 40; Case C-628/13 *Jean-Bernard Lafonta v Autorité des marchés financiers* ECLI:EU:C:2015:162, para 38.

²⁷³ Regulation (EU) No 596/2014 (n 63) arts 3(20), 17(2); Annunziata, 'Can Finance Help Save the Planet? The Case of Emission Allowances and MiFID II' (n 213) 14; ESMA, *Final Report* (n 193) 19, para 38.

nominal thermal input fall below the specified thresholds are exempt from Article 17(2), and information regarding emission sources below this threshold is in no way considered inside information. This adjustment limits the disclosure obligation to operators whose physical activities could genuinely influence the European carbon price.²⁷⁴

3.4.3. Insider Dealing, Unlawful Disclosure and Insider Lists

These prohibitions apply to allowances in the same way as they do to all other financial instruments. Article 8 prohibits insider dealing, including the cancellation or modification of orders placed prior to the acquisition of inside information. Article 10 prohibits the unlawful disclosure of inside information outside the normal course of employment or professional duties and Article 18 requires EAMPs to maintain insider lists of all persons who have access to inside information relating to their physical operations.²⁷⁵ The operation of these prohibitions is governed by the presumption established by the Court of Justice in the *Spector Photo Group* case. If a person in possession of inside information buys or sells the relevant instruments, it is presumed that that person has used the information in question, subject to the right of defence and the possibility of rebuttal.²⁷⁶ However, applying this framework to the carbon market presents a particular challenge, as the main participants are industrial operators rather than financial institutions, and their day-to-day operations lead to the organic generation of the very information subject to the prohibitions. If a trader within a compliance organisation obtains information regarding an unplanned outage or a non-public reduction in free allocation, it is strictly prohibited for that trader to trade on the basis of such information prior to its public disclosure.²⁷⁷ The threshold mechanism described above is the primary tool used by the regulator to strike a balance between market integrity and the operational realities of the sector.

3.4.4. Market Manipulation, Cross-Market Risk and REMIT

Article 12 of the MAR prohibits all fundamental forms of market manipulation. Transactions or orders that send false or misleading signals regarding the supply, demand or price of an emission allowance; conduct that fixes the price at an abnormal or artificial level, including by

²⁷⁴ Commission Delegated Regulation (EU) 2016/522 of 17 December 2015 supplementing Regulation (EU) No 596/2014 [2016] OJ L88/1; Annunziata (n 213) 15; ESMA, *Final Report (n 193)* 19, paras 38-39.

²⁷⁵ Regulation (EU) No 596/2014 (n 63) arts 8, 10, 18, recital 25.

²⁷⁶ Case C-45/08 *Spector Photo Group NV and Chris Van Raemdonck v CBFA* ECLI:EU:C:2009:806, para 62.

²⁷⁷ Annunziata (n 213) 14-15.

gaining a dominant position over supply or demand; and manipulation carried out through fictitious devices, such as wash trading and spoofing, are prohibited under this Article.²⁷⁸ The Regulation also contains a prohibition specific to the carbon market. Pursuant to Article 12(2)(e), the buying and selling of emission allowances on the secondary market prior to an auction, with the aim of fixing the auction clearing price at an abnormal or artificial level or misleading bidders, constitutes manipulation.²⁷⁹ Detection is, in the first instance, the responsibility of the market itself. Article 16 obliges market operators, investment firms operating trading platforms, and persons professionally arranging or executing transactions to establish systems to detect suspicious transactions and orders and to report them to the competent authority.²⁸⁰ Sanctions are applied at two levels: Article 30 of the MAR requires the competent authorities of Member States to impose administrative sanctions, whilst the accompanying Market Abuse Directive obliges Member States to define insider dealing and market manipulation as criminal offences and to extend liability to legal persons.²⁸¹

However, the most significant risk of manipulation in the carbon market is the cross-market risk. As electricity generators are required to surrender emission allowances in return for the electricity they generate, the carbon market is structurally intertwined with the wholesale energy market, which is subject to its own integrity regime. The Regulation on Wholesale Energy Market Integrity and Transparency (REMIT), which is supervised by the Agency for the Cooperation of Energy Regulators (ACER), prohibits insider trading and market manipulation in wholesale energy products (spot and derivative contracts for electricity and gas).²⁸² Spot emission allowances are outside the scope of REMIT as they are not wholesale energy products within the meaning of Article 2(4). However, data on allowance transactions must be provided to ACER precisely because of their impact on electricity prices, and information required to be disclosed under REMIT is considered inside information for the purposes of MAR.²⁸³ Recital 13 of MAR explicitly warns that manipulation may occur across borders, between electricity and gas markets, and between financial and commodity markets,

²⁷⁸ Regulation (EU) No 596/2014 (n 63) art 12(1)-(2).

²⁷⁹ *ibid* art 12(2)(e).

²⁸⁰ *ibid* art 16.

²⁸¹ *ibid* art 30; Directive 2014/57/EU of the European Parliament and of the Council of 16 April 2014 on criminal sanctions for market abuse [2014] OJ L173/179, arts 3-9.

²⁸² Regulation (EU) No 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency [2011] OJ L326/1 (REMIT); Annunziata (n 213) 10.

²⁸³ Annunziata (n 213) 9; REMIT (n 282) arts 2(4), 10; ESMA, *Final Report (n 193)* 134, para 439; Annunziata (n 66) 703.

including the emissions allowance market. For example, the dissemination of false information regarding production capacity directly distorts demand for and the price of allowances.²⁸⁴

This interdependence requires constant coordination between the financial supervisory authorities implementing the MAR and the energy regulatory authorities implementing the REMIT. ESMA has criticised the resulting division of responsibilities between national competent authorities (NCAs), ESMA, national regulatory authorities (NRAs) and ACER, arguing that it leads to conflicts of authority and delayed responses to crises, and has proposed that certain MiFID organisational requirements be extended to spot market participants subject to REMIT.²⁸⁵

3.4.5. The Primary Market: From the Auctioning Regulation to MAR

The primary market—that is the auctioning of emission allowances—is subject to the Auctioning Regulation. This regulation has centralised national auctions, which might otherwise have been fragmented, on a common platform, the European Energy Exchange (EEX), and has restricted participation in the auction to compliance operators and investment firms and credit institutions authorised under MiFID II, bidding on their own behalf or on behalf of their clients.²⁸⁶ As spot emission allowances are not financial instruments under MiFID I, the original Auction Regulation was compelled to establish its own regulatory microcosm. Articles 37 to 43 established a market abuse regime specific to auctions, meticulously reflecting the definitions of inside information, trading on inside information and market manipulation set out in the 2003 Market Abuse Directive, which was in force at the time.²⁸⁷ The MiFID II classification has rendered this parallel regime obsolete. As MAR now applies directly to bids on the auction platform, the auction-specific market abuse provisions become obsolete, and the framework has had to be incorporated into the recast of the 2023 Auction Regulation, which now provides the legal basis for the timing and management of auctions.²⁸⁸

²⁸⁴ Regulation (EU) No 596/2014 (n 63) recital 13; Annunziata (n 213) 9.

²⁸⁵ ESMA, *Response to the EC Commodity Derivatives Review* (n 262) 19, para 90.

²⁸⁶ Commission Regulation (EU) No 1031/2010 of 12 November 2010 on the timing, administration and other aspects of auctioning of greenhouse gas emission allowances [2010] OJ L302/1 (Auctioning Regulation), art 18(1)-(2).

²⁸⁷ Auctioning Regulation (n 286) arts 36(2), 37-43; Annunziata (n 66) 704.

²⁸⁸ Regulation (EU) No 596/2014 (n 63) recital 37, art 2(1); Commission Delegated Regulation (EU) 2023/2830 of 17 October 2023 [2023] OJ L 2023/2830; ESMA, *EU Carbon Markets 2025* (n 190) 2.

Supervision of the primary market is multi-layered. The auction platform must be authorised as a regulated market by the competent authority of its Member State. For EEX, this is the German BaFin, and a designated auction monitor reviews transparency and compliance, whilst the platform submits monthly reports on bidding behaviour and concentration to the Commission and BaFin.²⁸⁹ The structural feature most relevant to market integrity is concentration. As noted in Section 3.1, approximately ten participants account for around ninety per cent of the volumes traded in the auction. Regulators have so far refused to treat this as an integrity issue. The rationale is that it reflects the outsourcing of trading activities by thousands of compliance entities to a small number of financial intermediaries, and that the auction design — a single blind bidding window and a uniform clearing price — structurally renders order book manipulation ineffective. No reports of suspicious transactions related to auction concentration have been recorded.²⁹⁰ Nevertheless, concentration remains under active surveillance as a potential vector for market squeezes, and the specific prohibition under Article 12(2)(e) exists precisely for this purpose: to monitor the boundary between the secondary market and the auction clearing price.

3.4.6. The Voluntary Market: Abuse Without a Regime

The final and most significant feature of the market abuse framework is that it does not apply to the voluntary market. As VCCs fall outside the definition of a financial instrument under MiFID II, they are automatically excluded from the scope of the Market Abuse Regulation (MAR). Spot VCC transactions are not subject to prohibitions on insider trading or price manipulation; a party possessing confidential information regarding the underlying project—such as a forest fire or a registry authority preparing to revoke a project’s certificate—that could influence prices may trade on the basis of such information without fear of liability.²⁹¹ As noted by IOSCO, oversight of the voluntary spot market is, in most jurisdictions, limited to ex-post anti-fraud measures based on reports and complaints. The proactive monitoring and reporting of suspicious transactions required in regulated markets is absent in these markets.²⁹² This gap is not merely a theoretical concern. This situation is structurally linked to the integrity crisis and greenwashing cases examined in Chapter 2. A market where the listing of fictitious credits

²⁸⁹ Auctioning Regulation (n 286) arts 25(1)(c), 35(1), 53(2).

²⁹⁰ ESMA, *EU Carbon Markets 2025* (n 190) 4, 9.

²⁹¹ Haut Comité Juridique de la Place Financière de Paris (n 27) 24, 27.

²⁹² IOSCO, *Voluntary Carbon Markets Consultation Report* (n 242) 60.

does not lead to any regulatory sanctions is a market where institutional users who utilise these credits assume the legal risk.²⁹³

This gap has prompted regulators on both sides of the Atlantic to take action. IOSCO's Good Practices report calls on regulators to impose sanctions against fraudulent and abusive practices—including, in particular, false and misleading statements regarding the characteristics of carbon credits—and to establish market surveillance systems using transaction and position data. The HCJP recommends that these practices be integrated into national regulatory systems so that the voluntary market can be supervised in the same way as other financial products.²⁹⁴ The country that has taken the most significant steps is the US. Rather than waiting for new legislation, the Commodity Futures Trading Commission established an Environmental Fraud Task Force in June 2023 and, by issuing whistleblower alerts targeting wash trading and the listing of fictitious 'ghost' credits, has utilised its existing commodity regulatory authority to implement a manipulation prevention regime over the voluntary market.²⁹⁵ The asymmetry between a comprehensively regulated compliance market and a largely privately regulated voluntary market is the subject of the final section of this chapter.

3.5. Market Integrity and the Compliance-Voluntary Divergence

The main themes of this chapter converge in a final assessment of market integrity. The financial regulation of carbon markets arose from a crisis of integrity. The question this chapter must address is whether this regulation has been successful, and for which market. This section examines the criminal consequences of the fraud era and the legal responses it triggered, the empirical state of today's regulated market, the structural differences between a comprehensively regulated compliance market and a largely unregulated voluntary market, and the position of the EU approach from a comparative perspective.

3.5.1. The Criminal Aftermath and the Legislative Response

The fraud cases described in section 3.1 did not go unpunished. The fact that these cases were prosecuted in three different jurisdictions demonstrates both, the scale of the crime and the

²⁹³ See Chapter 2, sections 2.4.5-2.4.7.

²⁹⁴ IOSCO, *Good Practices for Voluntary Carbon Markets* (n 137) Good Practices 18-19; Haut Comité Juridique de la Place Financière de Paris (n 27) 27.

²⁹⁵ US Commodity Futures Trading Commission (n 245) 83380, 83383.

extent to which the national courts ultimately took this matter seriously. In the UK, the Court of Appeal, in the case of *Dosanjh and others v R*, upheld convictions for ‘missing trader’ type intra-Community fraud committed via carbon credits, which caused a loss of £39 million to the public purse, imposing prison sentences of fifteen, eleven and nine years respectively.²⁹⁶ The appellants argued that their sentences should be limited to the statutory maximum of seven years for VAT fraud. The Court firmly rejected this argument, stating that the common law offence of conspiracy to cheat the public revenue was deliberately retained by Parliament for cases of revenue fraud so serious that the statutory maximum penalties would not adequately reflect the gravity of the offence.²⁹⁷ In Germany, meanwhile, the Federal Court of Justice upheld convictions arising from a case involving a fictitious trader and a buffer chain scheme in which over 260 million euros in VAT were evaded. In this process, it determined that the tax authorities’ tactical decision to allow the fraud to continue temporarily in order to identify its organisers did not mitigate the defendants’ guilt, as a criminal has no right to demand early intervention by the authorities against their own crimes.²⁹⁸

In a second ruling, the same court upheld the convictions of Deutsche Bank employees who had facilitated this cycle for corporate clients. To keep the highly profitable carbon trading desk afloat, the defendants had circumvented ‘know your customer’ procedures and misled the bank’s own Reputation Risk Committee and compliance department with false and incomplete information. The court characterised this behaviour as acting as a gang (*bandenmäßige Begehung*) under the German Tax Code.²⁹⁹ In France, the epicentre of the exchange-traded fraud via BlueNext, the Paris courts convicted the organisers of a series of fraud rings that began with the Sakoun network, resulting in the ringleader being sentenced to five years’ imprisonment and a fine of 1 million euros in 2012, and thirty-six individuals being jailed in 2018 for their roles in a broader carbon VAT fraud scheme.³⁰⁰ Taken as a whole, these prosecutions reveal what Frunza described as the profound moral hazard of the early carbon market. It reveals that the line between moral hazard and crime is illusory, as reputable financial institutions, blinded by rising volumes and profits, have become channels for organised crime’s

²⁹⁶ *Dosanjh and others v R* [2013] EWCA Crim 2366.

²⁹⁷ *ibid.*

²⁹⁸ BGH, Beschluss vom 21 November 2012 - 1 StR 391/12.

²⁹⁹ BGH, Urteil vom 15 May 2018 - 1 StR 159/17, partly dismissing and partly allowing the appeals against LG Frankfurt am Main, Urteil vom 13 June 2016 - 5/2 KLS 6/15.

³⁰⁰ Frunza (n 202) 125-26; Transparency International, ‘Carbon Tax Fraud in France’ (Climate & Corruption Case Atlas) <<https://www.transparency.org/en/projects/climate-governance-integrity-programme/climate-corruption-atlas/carbon-tax-fraud-in-france>> accessed 13 June 2026

liquidity and money laundering by turning a blind eye to the dubious nature of their counterparties and circumventing their own compliance protocols.³⁰¹

The legal regulations address both the financial and infrastructural weaknesses exploited by fraudsters. With the aim of curbing carousel fraud, the Council amended the VAT Directive by adopting Directive 2010/23/EU, thereby allowing Member States to apply an optional reverse charge mechanism to transactions involving emission allowances. This mechanism, which shifts the VAT liability from the seller to the buyer, cut off the cash flow to the missing trader and effectively eliminated carousel fraud in the carbon market.³⁰² To safeguard the infrastructure, the Union replaced approximately thirty national registries in 2012 with a single Union Registry governed by the Registry Regulation. This regulation introduced bank-like customer due diligence requirements for account opening and granted national administrators the authority to reject or suspend accounts in cases of suspected money laundering, terrorist financing or fraud.³⁰³

3.5.2. The Integrity of the Regulated Market Today

Against this historical backdrop, the latest empirical data on the compliance market is noteworthy. ESMA's latest monitoring reports paint a picture of a healthy market. The 2024 report states that the analyses conducted did not reveal any significant issues in the functioning of the EU carbon markets, and the 2025 report reiterates that ESMA did not identify any significant issues regarding the market's integrity or transparency.³⁰⁴ The Commission similarly noted that national competent authorities have not reported any cases of market abuse or insider trading, and detailed audit data corroborates this. The German regulatory authority received a single report of a suspicious transaction related to potential insider trading prior to the "Fit for 55" announcements. This report was closed after it was determined that the information was

³⁰¹ Frunza (n 202) xi, 156-60.

³⁰² Council Directive 2010/23/EU of 16 March 2010 amending Directive 2006/112/EC on the common system of value added tax, as regards an optional and temporary application of the reverse charge mechanism in relation to supplies of certain services susceptible to fraud [2010] OJ L72/1.

³⁰³ Commission Regulation (EU) No 389/2013 (n 118) arts 22(2), 34(1); Milieu Ltd, Ecologic and Klimapolitika (n 55) 171.

³⁰⁴ ESMA, *EU Carbon Markets 2024* (n 192) 4; ESMA, *EU Carbon Markets 2025* (n 190) 4.

already publicly available; Dutch and Norwegian authorities, meanwhile, recorded a few reports each, but no sanctions were imposed in any of these cases.³⁰⁵

Market price movements also point to the same conclusion: the 22% decline in the average emission allowance price in 2024 was driven by weak demand resulting from the ongoing decarbonisation process in the energy sector and increased auction volumes. Prices showed a high correlation with natural gas prices, and volatility remained limited. This indicates that the market is driven by fundamental economic indicators rather than being distorted by market abuse.³⁰⁶ The structural shortcomings identified earlier in this section—the OTC spot blind spot, the lack of transaction chain consolidation, the absence of central monitoring, and the delay in adopting legal entity identifiers in the Union Registry—remain on the oversight agenda; however, these are not evidence of market manipulation but rather gaps in transparency.³⁰⁷

3.5.3. The Compliance-Voluntary Divergence and the Limits of Private Ordering

The success of the compliance market clearly highlights the position of the voluntary market. The differences between the two markets discussed throughout this section can be systematically summarised. While compliance market platforms must be authorised under MiFID II, voluntary spot platforms do not require any financial licence. Compliance derivatives are subject to EMIR's clearing and margin requirements, whereas voluntary derivatives largely fall outside these requirements. Compliance instruments are subject to pre- and post-trade transparency and mandatory trade reporting; in contrast, spot VCC transactions ensure that regulators do not have access to information regarding volume, positions, and prices. While the compliance market is supervised by the MAR, the voluntary market lacks any legal prohibition against insider trading or market manipulation. The regulated market is continuously supervised by the ESMA and national authorities; the voluntary market, however, has no dedicated supervisory body.³⁰⁸

This gap has been filled through a comprehensive regulatory framework established by the private sector. On the supply side, the Integrity Council for the Voluntary Carbon Market

³⁰⁵ European Commission, *Report on the Functioning of the European Carbon Market* COM (2022) 516 final (n 201) 27; ESMA, *Final Report* (n 193) 28-34, paras 107-29, 150.

³⁰⁶ ESMA, *EU Carbon Markets 2025* (n 190) 4, 10.

³⁰⁷ See sections 3.2.4 and 3.3.4 above; ESMA, *EU Carbon Markets 2025* (n 190) 4.

³⁰⁸ IOSCO, *Good Practices for Voluntary Carbon Markets* (n 137) 44; US Commodity Futures Trading Commission (n 245) 83387, 83391; IOSCO, *Voluntary Carbon Markets Consultation Report* (n 242) 60.

requires credits to be real, additionally and permanent by evaluating crediting programs against the Core Carbon Principles, while on the demand side, the Voluntary Carbon Markets Integrity Initiative's Claims Code of Practice regulates the reliability of offset-based corporate claims.³⁰⁹ Exchanges ensure quality through listing standards that limit tradable credits to approved registries. ISDA documentation standardises the bilateral market, and private rating agencies provide project-level risk assessments. However, as noted by IOSCO, they do so without the regulatory oversight applied to credit rating agencies, which raises concerns about potential conflicts of interest.³¹⁰ The fundamental limitation of this structure is the lack of legal enforceability. Standard-setters cannot impose fines or imprisonment, cannot mandate market-wide reporting, and cannot force a fragmented ecosystem to converge under a single standard. Public law has begun to support these private initiatives. The CRCF Regulation establishes a Union certification framework for carbon removals; the Green Claims Directive requires the verification of offset-based environmental claims; California has mandated disclosure in voluntary carbon transactions; and Egypt has launched a regulated voluntary market. However, these tools regulate the use and certification of credits, not the credit market itself.³¹¹

The question of whether the voluntary market should be fully incorporated into the scope of financial regulation remains a matter of debate. The HCJP argues that the voluntary market should be regulated in the same way as other financial products, so that manipulation and insider trading—which are currently tolerated—can be penalised, while respondents to IOSCO's consultation have warned that classifying spot credits as financial instruments would replicate existing regulations on VCC derivatives and impose heavy costs on a newly emerging market. This divergence of views has prevented IOSCO from issuing any uniform recommendation.³¹²

3.5.4. The EU Approach in Comparative Perspective

The EU's decision to classify spot emission allowances as financial instruments remains a unique situation on a global scale. The United Kingdom, which transposed the EU framework

³⁰⁹ IOSCO, *Voluntary Carbon Markets Consultation Report* (n 242) 44, 60; US Commodity Futures Trading Commission (n 245) 83387, 83391.

³¹⁰ IOSCO, *Good Practices for Voluntary Carbon Markets* (n 137) 24; Spilker and Nugent (n 106) S109-S110.

³¹¹ Regulation (EU) 2024/3012 (n 138); Haut Comité Juridique de la Place Financière de Paris (n 27) 33; World Bank, *State and Trends of Carbon Pricing 2025* (n 168) 247; Congressional Research Service, *Voluntary Carbon Credit Markets and the Commodity Futures Trading Commission* (CRS Report R48095, 13 June 2024) 18; IOSCO, *Good Practices for Voluntary Carbon Markets* (n 137) 51-52.

³¹² Haut Comité Juridique de la Place Financière de Paris (n 27) 28-29; IOSCO, *Good Practices for Voluntary Carbon Markets* (n 137) 43.

into national legislation following its withdrawal from the EU, has retained this classification. UK emission allowances and their derivatives are regulated as financial instruments under the transposition of MiFID II and MAR into UK law, and UK emission allowance derivatives traded within the Union are classified as C(4) financial instruments, even though the underlying units fall outside the scope of C(11).³¹³ In contrast, the United States treats compliance allowances under the California Cap-and-Trade Program and the Regional Greenhouse Gas Initiative as commodities under the Commodity Exchange Act. While derivatives of these allowances fall within the CFTC’s broad jurisdiction, the underlying spot markets are regulated by state environmental authorities and are subject only to the Commission’s residual enforcement authority regarding fraud and manipulation.³¹⁴

China’s national emissions trading system, the world’s largest in terms of volume, exhibits an even more pronounced dichotomy. While spot emission allowances are regulated by the environmental administration as compliance instruments, derivatives fall under the jurisdiction of the securities regulatory authority within the framework of the general futures trading law. The fact that spot instruments are not subject to any financial classification pushes innovative carbon finance products into a legal gray area.³¹⁵ Consequently, the comparative picture is one of divergence in the spot market and convergence in the derivatives market. The EU is the only jurisdiction that subjects spot allowances to capital markets law; however, options, futures, and swaps related to compliance allowances are generally treated as financial or commodity derivatives and are subject to exchange trading rules, clearing requirements, and high-level financial oversight.³¹⁶

This comparative difference highlights the role—or, more accurately, the absence—of international law in the financial governance of carbon markets. There is no binding international instrument regulating the trading of carbon credits as financial assets. Instead, international-level regulations consist of “soft law” from trans governmental networks; the most prominent elements in this context are the “good practices” of IOSCO and its explicit rejection of a uniform classification, along with transnational private ordering established through ISDA documents, exchange listing standards, and voluntary market integrity

³¹³ Yang (n 190) 18-22; see section 3.2.5 above.

³¹⁴ Haut Comité Juridique de la Place Financière de Paris (n 27) 29; Congressional Research Service (n 311) 1-2.

³¹⁵ Chen and Wu (n 205) 41-43, 51-56.

³¹⁶ Chen and Wu (n 205) 51-56; Yang (n 190) 18-22.

initiatives.³¹⁷ Consequently, the financial regulation of carbon remains a domain of national and regional law, coordinated at best through non-binding harmonisation. This fragmentation mirrors the fragmentation of private law identified in Chapter 2 at the regulatory level, and its implications for the international coordination of carbon markets are addressed in Chapter 5.

3.6. Conclusion: Regulation Upon an Indeterminate Substrate

When the findings of this chapter are taken together, the financialisation of the carbon market has been a regulatory success when compared to the period prior to 2018, which was marked by carousel fraud, allowance theft, and regulatory gaps. The combination of MiFID II authorisation, EMIR clearing and reporting, MAR supervision, and a secure Union Registry has eliminated the criminal activities that were widespread in the early stages. Criminal courts in three jurisdictions have imposed exemplary penalties on perpetrators from the fraud era, and current supervisory records do not raise significant integrity concerns. Furthermore, in a development that can be considered a significant success, ESMA has confirmed in successive reports that prices follow market fundamentals and that no significant issues regarding market integrity or transparency have been identified.³¹⁸

However, the fact remains that this success is limited in three ways. Externally, this success does not extend to the voluntary market; here, the absence of financial regulation has left its integrity to private ordering. Examples include the Core Carbon Principles, the VCM Claims Code, stock exchange listing standards, and ISDA documents, but their fundamental limitation is the lack of legal enforceability. Standard-setters cannot impose fines or prison sentences, cannot mandate market-wide reporting, and cannot force a fragmented ecosystem to come together.³¹⁹ On the other hand, at the international level, there is no binding instrument regulating the trading of carbon units as financial assets. The international layer consists of the soft law of intergovernmental networks; consequently, the financial regulation of carbon remains, at best, a limited domain of national and regional law coordinated through non-binding harmonisation. This fragmentation reflects the fragmentation of private law identified in Chapter 2 at the regulatory level, and its consequences are addressed in Chapter 5.³²⁰

³¹⁷ IOSCO, *Good Practices for Voluntary Carbon Markets* (n 137) 31-32; see sections 3.3.5 and 3.5.3 above.

³¹⁸ ESMA, *EU Carbon Markets 2024* (n 192) 4; ESMA, *EU Carbon Markets 2025* (n 190) 4.

³¹⁹ IOSCO, *Good Practices for Voluntary Carbon Markets* (n 137) 24, 44; see section 3.5.3 above.

³²⁰ IOSCO, *Good Practices for Voluntary Carbon Markets* (n 137) 31-32; see section 3.5.4 above.

Finally, and most fundamentally, the regulatory framework does not reach the foundations of the instrument itself. As Gorzelak noted at the outset of this system, the classification of emission allowances as financial instruments stemmed not from any implications regarding the legal status of the emission allowance itself, but rather from the necessity of subjecting the market to financial oversight. Yliheljo notes that the legal nature of the unit retains its mystery at the intersection of climate law, private law, and financial regulations. Przybojewska and Pyka observe that applying a framework designed for traditional financial instruments to an environmental compliance unit generates legal fragmentation and additional costs for market participants, though they ultimately conclude that these drawbacks do not outweigh the legal certainty that MiFID II provides. That certainty is nevertheless bounded: as the Milieu study confirms, even under MiFID II, the meaning and scope of the rights attached to an allowance must still be determined under the relevant private law.³²¹ In short, financial regulation remains neutral regarding the ownership basis when regulating the trading of carbon instruments—it builds upon the uncertainty outlined in Chapter 2 but does not resolve it.

There is a final irony in the fact that it was taxation—not property law or financial regulations—that first forced the Union to clarify what an “allowance” is. Tax implications have driven the need for a definition. Faced with carousel fraud schemes, the VAT Committee concluded that the transfer of an allowance constitutes a taxable supply of services in the form of an assignment of intangible property under the VAT Directive. The reverse charge mechanism under Directive 2010/23/EU is based on this characterisation.³²² However, the classification of allowances for VAT purposes does not address how they should be treated for corporate tax and accounting purposes, nor does it resolve the cross-border tax issues arising when carbon allowances move between different jurisdictions. The analysis in Chapter 4 focuses on these questions, specifically the taxation of carbon certificates.

³²¹ Gorzelak (n 26) 376; Yliheljo (n 68) 46; Przybojewska and Pyka (n 215) 13-14; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 186.

³²² Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 31-32, 169; Council Directive 2006/112/EC of 28 November 2006 on the common system of value added tax [2006] OJ L347/1, arts 24-25; Council Directive 2010/23/EU (n 302).

IV. THE TAXATION OF CARBON CERTIFICATES

4.1. Introduction: Taxation upon an Undefined Asset

A recurring issue has been discussed in the previous two sections. The laws regulate the trading of these instruments without clarifying what a carbon certificate is under private law. While Chapter 2 demonstrated that the property rights of emission allowances serve an instrumental function determined by national law rather than the EU ETS Directive, Chapter 3 showed that the financial regulatory framework operates within this uncertainty but does not resolve it. Taxation is the area where this unresolved foundation yields the most concrete and distinct consequences. Unlike financial regulation, which the Union harmonises through directly applicable instruments, the taxation of carbon instruments is divided between the value-added tax—a harmonised indirect tax—the corporate tax and accounting sectors, where the treatment of allowances depends almost entirely on how each member state classifies them under its domestic law. As a result, a single, fungible compliance instrument operating within a single internal market is subject to taxation under differing national rules because the underlying asset has never been defined.³²³

This section examines the fragmented structure from four perspectives. It begins with value-added tax (VAT), the only area in which the Union has succeeded in establishing both a common classification system and a coordinated enforcement mechanism against large-scale fraud. It then addresses an issue that encompasses all tax analysis but is most evident in the context of VAT: the tax treatment of an allowance depends on the legal status of the person who holds it. After moving on to corporate tax and the accounting treatment of allowances—areas where the withdrawal of the sole initiative to establish a uniform standard has left a lasting gap—the chapter turns to the cross-border dimension and the limited guidance provided by the OECD. The chapter concludes with a comparative study of selected Member States, illustrating in concrete financial terms how the private law uncertainty identified in Chapter 2 manifests in the tax domain.

³²³ Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 119, 126.

4.2. Value Added Tax: Supply of Services, Carousel Fraud, and the Reverse Charge

4.2.1. The Classification of Allowances as a Supply of Services

Value-added tax is the area where the European Union has most clearly and earliest defined the legal nature of carbon allowances. Article 24 of the VAT Directive defines the supply of services as any transaction that does not constitute a supply of goods. Article 25, meanwhile, specifies that such a supply may consist of the transfer of intangible assets, whether or not it is the subject of a document establishing a right of ownership, among other matters.³²⁴ On this basis, the VAT Committee unanimously agreed in 2004 that the transfer of an allowance by a taxable person in return for consideration constitutes a taxable supply of services—specifically, the transfer of intangible assets classified as services under Article 25(a).³²⁵ This characterisation is of overall importance for the issues examined in this thesis. Faced with the practical necessity of taxing allowance transactions, Union tax authorities have adopted a positive legal characterisation of such transactions—as intangible assets transferred via a service—which neither the EU ETS Directive nor the financial regulatory framework is willing to provide. The fact that the first authoritative characterisation of this instrument emerged from indirect tax law is an inherent indication of where the practical pressure to define it was most intense.

The same classification determines where allowance transactions are to be taxed, and it is precisely this “place of supply of services” aspect that makes the system vulnerable to fraud. As provided in Article 44 of the VAT Directive and as amended by Directive 2008/8/EC, the place of supply of services provided to taxable persons is the Member State in which the recipient of the service is established.³²⁶ The Court of Justice confirmed in Case *A and B* that allowances fall within the scope of “similar rights” covered by this regime. Although allowances do not fall within the field of intellectual property, the Court ruled that they constitute intangible assets, confer an exclusive right, and are subject to registration; on this basis, it determined that Article 56(1)(a) must be interpreted as also covering greenhouse gas emission allowances as defined in the EU ETS Directive.³²⁷ The consequence of taxing the

³²⁴ Council Directive 2006/112/EC of 28 November 2006 on the common system of value added tax [2006] OJ L347/1, arts 24-25.

³²⁵ *Milieu Ltd, Ecologic and Klimapolitika* (n 55) 32.

³²⁶ Council Directive 2008/8/EC of 12 February 2008 amending Directive 2006/112/EC as regards the place of supply of services [2008] OJ L44/11; Council Directive 2006/112/EC (n 324) art 44.

³²⁷ Case C-453/15 *Criminal proceedings against A and B* ECLI:EU:C:2016:933, paras 21-22 and operative part; see also the Opinion of AG Wathelet, ECLI:EU:C:2016:639.

supply at the recipient's location is that cross-border intra-Community transfers between taxpayers are effectively taxed at a zero rate in the country of origin. What carousel fraudsters exploit is precisely this structural feature combined with the intangible and immediately transferable nature of the allowances.

4.2.2. The Carbon Allowance as the Ideal Vehicle for Carousel Fraud

This security vulnerability was exploited on a massive scale through intra-Community missing trader (MTIC) or carousel fraud. In its simplest form, a fraudulent trader could purchase VAT-exempt emission allowances from a supplier in another member state, resell them domestically at a price including VAT, and then disappear without paying the collected tax to the treasury.³²⁸ In the carousel variant, the same emission allowances passed through a series of intermediary companies—some of which may have been unaware of the fraud—before being re-exported to restart the cycle. Thus, as Nield and Pereira noted, the amount of VAT evaded through fraud multiplied with each cycle.³²⁹

What distinguished carbon fraud from earlier forms of fraud was the nature of the underlying asset. As Ainsworth argued, carbon MTIC fraud represented the dawn of the digital future of VAT fraud. While physical goods always create issues with physical delivery, this right was open to intangible assets—efficient yet highly permeable—that could be transferred with a single mouse click in an EU-backed digital market, enabling fraudsters to order millions of tons of carbon dioxide from a café.³³⁰ Frunza's forensic analysis highlights the same point in economic terms. A carbon credit is a weightless, cost-free electronic commodity with significant unit value, recorded in national registries and transferable between countries in a manner that allows a single round-trip transaction to be completed in a matter of hours.³³¹ The market impact is equally dramatic. In this regard, trading volume on the BlueNext exchange set a record in June 2009, reaching 19.8 million tons in a single day. However, when French authorities intervened to eliminate the VAT risk following this record, daily spot trading volume

³²⁸ Robert Nield and Ricardo Pereira, 'Fraud on the European Union Emissions Trading Scheme: Effects, Vulnerabilities and Regulatory Reform' (2011) 20 *European Energy and Environmental Law Review* 255, 7; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 112.

³²⁹ Nield and Pereira (n 328) 7.

³³⁰ Richard T Ainsworth, '*CO2 MTIC Fraud — Technologically Exploiting the EU VAT (Again)*' (Boston University School of Law Working Paper No 10-01, 2010) 6, 15-16.

³³¹ Frunza (n 202) 65, 96.

plummeted by over 85 percent. This situation can be classified as a natural experiment revealing how much of the apparent liquidity was fraud-driven.³³²

According to Frunza's econometric recalculation, this fraud inflated spot trading volumes to up to ten times their normal levels and caused prices to fall by acting as an invisible dividend that eroded the value of permits. In doing so, it also decoupled the carbon price from its environmental and economic fundamentals.³³³ Europol has estimated the loss to national treasuries at approximately 5 billion euros; however, according to Frunza's recalculation, which also takes over-the-counter transactions into account, this figure rises to between 8 and 10 billion euros.³³⁴

4.2.3. The Fragmented National Response

The initial response to fraud remained unilateral and uncoordinated. This situation highlights the same fragmentation that has repeatedly emerged in the financial sector throughout this thesis. As the scale of the fraud became apparent in 2009, member states were left to act on their own and in an inconsistent manner. France was forced to suspend trading on BlueNext and exempt emission allowances from VAT. The Netherlands introduced a reverse charge mechanism domestically; the United Kingdom applied a zero-rate to supplies as a temporary measure before adopting its own reverse charge mechanism; and Denmark and Spain were compelled to take different measures.³³⁵ As Ainsworth noted, these differing national measures protected the countries that acted but, inadvertently, turned them into bases for fraudsters. Fraudsters implemented a scheme where they purchased VAT-exempt emission allowances in protected jurisdictions and sold them to member states that continued to apply VAT. Frunza's analysis confirms that the fraud cycle has not ended but has instead reversed.³³⁶ This incident demonstrates that fragmented national responses to the single market instrument have not eliminated abuse but merely shifted it elsewhere. This observation holds equally true for the private law and regulatory fragmentation examined in previous sections.

³³² Nield and Pereira (n 328) 9.

³³³ Marius-Christian Frunza, Dominique Guégan and Florian Thiebaut, 'Missing Trader Fraud on the Emissions Market' (Documents de Travail du Centre d'Économie de la Sorbonne, 2010); Frunza (n 202) 84-86, 94, 148.

³³⁴ Ainsworth (n 330) 2; Nield and Pereira (n 328) 9; Frunza (n 202) 69, 95-96.

³³⁵ Ainsworth (n 330) 8-9; Nield and Pereira (n 328) 9; Frunza (n 202) 136, 140.

³³⁶ Ainsworth (n 330) 22; Frunza (n 202) 147.

4.2.4. The Reverse Charge Mechanism and Its Limits

As part of a coordinated effort, Directive 2010/23/EU, published in March 2010, amended the VAT Directive to allow member states to apply the reverse charge mechanism to supplies of emission allowances.³³⁷ Under the reverse charge mechanism, the obligation to calculate VAT shifts from the supplier to the recipient. Since the purchaser, who calculates the output VAT, is typically the person entitled to reclaim it as input VAT, no VAT amount passes through the supplier's hands, and the fraudulent trader is deprived of the invoice that is the subject of the fraud.³³⁸ However, this measure was neither mandatory nor permanent. Directive 2010/23/EU provided only an optional and temporary exemption, and its validity has had to be successively extended through Directive 2013/43/EU, Council Directive (EU) 2018/1695, and most recently Council Directive (EU) 2022/890.³³⁹

In the academic literature, reverse charging is regarded as an effective but structurally inadequate solution. Ainsworth argues that this mechanism treats the symptom rather than the disease. By eliminating the partial payment nature of VAT on affected supplies, it effectively breaks the very chain it aims to protect. Furthermore, because this mechanism is optional and relies on its uniform adoption, it is neither scalable nor secure against fraud shifting to countries that do not adopt it.³⁴⁰ The EU legislative body has also acknowledged this point and, in the preamble to Directive (EU) 2022/890, admitted that the VAT Directive has not been significantly amended to address MTIC fraud in a more structural manner. The alternative favoured by Ainsworth—a digitised real-time VAT collection system—has not been adopted.³⁴¹ However, empirical data confirms its effectiveness where the reverse charge mechanism is applied. The adoption of this system at the national level has halted fraud in jurisdictions hosting the largest stock exchanges, and by 2016, twenty-two of the twenty-eight Member States had implemented it, significantly reducing the risk. However, the optional nature of the regime has led to the risk persisting in countries like Estonia that refused to adopt it.³⁴² Reverse charging thus stands out as a telling symbol of the Union's approach to carbon

³³⁷ Council Directive 2010/23/EU (n 302).

³³⁸ Nield and Pereira (n 328) 10; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 112.

³³⁹ Council Directive 2010/23/EU (n 302); Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 169-70; Council Directive (EU) 2022/890 of 3 June 2022 [2022] OJ L155/1.

³⁴⁰ Ainsworth (n 330) 17, 26.

³⁴¹ Council Directive (EU) 2022/890 (n 339) recital 2; Richard T Ainsworth, 'Carousel Fraud in the EU: A Digital VAT Solution' (2006) *Tax Notes International* 443; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 175.

³⁴² Nield and Pereira (n 328) 10-11; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 169-70, 174.

instruments. It can be summarised as a targeted, effective, yet partial and inconsistent Band-Aid solution applied to a specific manifestation of a deeper, unresolved problem.

4.2.5. The Court of Justice and the Integrity of the Place-of-Supply Rule

The final issue concerns the interaction between the place-of-supply rule and the fraud it gives rise to. On this point, the Court of Justice took care to preserve the integrity of the objective rule rather than relaxing it for the purpose of combating fraud. In the *Climate Corporation Emissions Trading* case, the Austrian tax authority sought to accept that the place of supply for a transfer of emission allowances was in Austria—and thus to tax the Austrian supplier—on the grounds that the supplier knew or should have known that the German buyer was using the transaction to evade VAT.³⁴³ The Court rejected this, stating that no provision of the VAT Directive permits the place of supply under Article 44 to be deemed to be in the supplier's Member State solely because of the purchaser's fraudulent conduct. Such an approach would be contrary to the objectives of the rules on the place of supply and would improperly confer fiscal authority on the supplier's state.³⁴⁴

When considered together with *A and B*, this case confirms that the place of supply of an allowance is determined by the buyer's objective location, that it is not extended to cover rights beyond the ordinary scope, and that it is not redrawn in response to the other party's fraud. Instead, the integrity of the system is safeguarded by the reverse charge mechanism and the general anti-abuse principle, and the place of supply rule itself remains unchanged.³⁴⁵

4.3. The Status of the Holder: Taxable Persons, Businesses, and Private Individuals

Whilst this is a general feature of the taxation of carbon instruments, the aspect most clearly evident in the context of VAT is that the tax treatment of an emission allowance depends not only on the nature of the instrument, but also on the legal status and conduct of the person holding and transferring it. Depending on whether the transferor is a business or a private individual, or whether the instrument is surrendered to comply with legislation or voluntarily, the transaction may or may not fall within the scope of taxation. The fact that the tax outcome

³⁴³ Case C-641/21 *Climate Corporation Emissions Trading GmbH v Finanzamt Österreich* ECLI:EU:C:2022:842, paras 12-17.

³⁴⁴ *ibid* paras 38, 42, 50.

³⁴⁵ *ibid*; Case C-453/15 (n 327).

depends on the identity and intention of the holder is the financial counterpart to the instrumental and context-dependent nature of the allowance defined in Section 2.

4.3.1. The VAT Threshold of the Taxable Person

The transfer of an allowance does not, in itself, give rise to a VAT liability. A VAT liability arises only if the transfer is carried out by a person acting in the capacity of a taxable person. Article 2(1) of the VAT Directive states that the supply of services is taxable only where it is carried out for consideration by a taxable person acting in that capacity, and Article 9(1) defines a taxable person as any person who carries out an economic activity independently, irrespective of the purpose or results thereof. Economic activity is defined as the use of tangible or intangible assets with a view to generating income on a continuous basis.³⁴⁶ The European Commission's guidance interprets economic activity broadly to encompass commercial activity in general, but concludes that private individuals do not generally engage in commercial activity and therefore will not be classified as taxable persons. The implication for the carbon market is that the taxable event is defined not by the instrument itself, but by the capacity in which the holder acts. When emission allowances are transferred within the scope of economic activity by an industrial operator, a trading company or a financial intermediary, this supply falls within the scope of VAT and is subject to the reverse charge rule examined above. However, a transfer made by a person acting outside the scope of any economic activity remains outside the scope of the tax.³⁴⁷

4.3.2. The Boundary of Economic Activity: When the Private Holder Becomes Taxable

The key question, therefore, is where the boundary of 'economic activity' lies. On this point, the Court of Justice is developing established case law that applies equally to the holder of carbon credits, even though the case in question concerned the sale of land and timber rather than emission rights. The starting point is that merely owning and disposing of an asset is not sufficient. In the *Slaby* case, the Court held that the mere exercise of the right of ownership by its holder cannot, in itself, be regarded as an economic activity. Consequently, a private individual selling an asset from their personal property does not, for that reason, become liable

³⁴⁶ Council Directive 2006/112/EC (n 324) arts 2(1), 9(1); *Milieu Ltd, Ecologic and Klimapolitika* (n 55) 32.

³⁴⁷ European Commission (Taxation and Customs Union), *Taxable Persons under EU VAT Rules* (guidance) <https://taxation-customs.ec.europa.eu/taxation/vat/vat-directive/taxable-persons-under-eu-vat-rules_en> accessed 13 June 2026; see section 4.2.4 above on the reverse charge; *Milieu Ltd, Ecologic and Klimapolitika* (n 55) 32.

for tax.³⁴⁸ The threshold is only crossed where the individual takes active steps to market the property by mobilising resources similar to those used by a producer, trader or service provider within the meaning of Article 9(1). This is a criterion which the Court also sets out in the operative part of its judgment.³⁴⁹

An additional criterion was established in the *Rēdlihs* case. In that case, the Court ruled that the exploitation of tangible property for the purpose of obtaining income on a continuing basis must be regarded as an economic activity, a principle that Article 9(1) of the VAT Directive extends equally to intangible property such as emission allowances. Consequently, even a private forest owner who regularly supplies timber may be classified as a taxable person.³⁵⁰ The *Kezić* case, however, confirms that a person carrying out a transaction in a private capacity does not act as a taxable person, and the transaction is not subject to VAT. However, active preparation and marketing steps remove this disposal from the scope of the management of private assets and bring it into the sphere of economic activity.³⁵¹

When these criteria are applied to the carbon market, they draw a fundamental distinction between holders of emission allowances. According to *Slaby*'s view, a person who purchases emission allowances and subsequently disposes of them as a one-off transaction within the scope of private asset management remains outside the scope of VAT, as they are deemed to have merely exercised their ownership of the asset. However, an individual who regularly buys and sells emission allowances, maintains a record-keeping account for this purpose, and takes active steps to market them by mobilising resources characteristic of a trader — in the manner identified in *Slaby* — engages in economic activity and, where this is done to obtain income on a continuing basis within the meaning of *Rēdlihs*, acquires the status of a taxable person.³⁵² The intangible, account-based nature of emission rights has made them an ideal instrument for the carousel fraud examined above. Consequently, it has ensured that the boundary between private ownership and taxable trade depends not on the instrument itself, but on the scale, regularity and organisation of the rights holder's conduct. The same active versus passive distinction also determines the direct tax position. In cases where national systems tax the income of an individual owner, the question of whether such income is of a private and capital nature or

³⁴⁸ Case C-180/10 *Slaby v Minister Finansów* ECLI:EU:C:2011:589, para 36.

³⁴⁹ *ibid* para 39 and operative part.

³⁵⁰ Case C-263/11 *Rēdlihs v Valsts ieņēmumu dienests* ECLI:EU:C:2012:497, paras 30, 32.

³⁵¹ Case C-331/14 *Kezić v Republika Slovenija* ECLI:EU:C:2015:456, paras 18, 24.

³⁵² Case C-263/11 (n 350) paras 30, 32.

constitutes the revenue of a business is subject to the same scrutiny regarding whether the owner's activity is occasional and for the purpose of ownership or organised and continuous.³⁵³

4.3.3. Compliance Instruments and Voluntary Credits

Another distinction, made regardless of the owner's status, relates to the nature of the credit and determines whether an instrument is included in the VAT base. This analysis focuses on the concept of consumption, which forms the basis of value added tax. Compliance instruments — permits and Kyoto units that can be used for compliance purposes — are surrendered by operators to fulfil a legal obligation. Consequently, they are deemed to have been consumed, thereby enabling the owner to continue their operations without incurring any penalties. As instruments suitable for the type of consumption envisaged by the VAT system, they fall within the scope of VAT.³⁵⁴ Conversely, voluntary credits are not used to fulfil any legal obligation and, in the view of some authorities, lack the element of consumption that renders an instrument subject to tax. Consequently, these have historically been treated as falling outside the scope of VAT.³⁵⁵ This treatment is neither definitive nor uniform and is evolving. In a comparative example from the United Kingdom, HM Revenue and Customs, which historically treated voluntary carbon credits as outside the scope of VAT, has changed its stance with effect from 1 September 2024. Such credits are now subject to VAT at the standard rate where they form part of commercial supplies.³⁵⁶

Consequently, the distinction between legal obligations and voluntary instruments, as discussed in Chapter 3 in the context of tax law, reflects the difference between regulated and unregulated markets. It confirms that the treatment of a carbon instrument under tax law is based on a classification—in this case, the instrument's function—which is not definitively established anywhere within the general framework of the law.

³⁵³ Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 81.

³⁵⁴ CW Energy LLP, *VAT — Liability of Non-Compliance Carbon Credits and Carbon Offsetting Services* (guidance note) <<https://cwenergy.co.uk/vat-liability-of-non-compliance-carbon-credits-and-carbon-offsetting-services/>> accessed 13 June 2026.

³⁵⁵ *ibid.*

³⁵⁶ 'Taxing Emissions: VAT and Voluntary Carbon Credits' (*Tax Adviser*, 2024) <<https://www.taxadvisermagazine.com/article/taxing-emissions-vat-and-voluntary-carbon-credits>> accessed 13 June 2026; HM Revenue and Customs, Revenue and Customs Brief (1 September 2024).

4.4. Corporate Income Tax and Accounting

4.4.1. The Accounting Foundation of the Tax Treatment

The treatment of emission allowances for corporation tax purposes cannot be considered in isolation from accounting procedures. This is because, in most Member States, the taxable result is based on the accounting result. However, there is no established international accounting standard for emission allowances. Businesses must devise an application method from standards designed for other purposes. Emissions allowances are generally accounted for as intangible fixed assets under IAS 38 on the grounds that they are identifiable non-monetary assets without physical substance. However, emissions allowances held for trading purposes within the ordinary course of business may instead be accounted for as inventory under IAS 2.³⁵⁷ Where emission allowances are allocated by a public authority free of charge or at a price below market value, the difference is, in principle, a government grant under IAS 20 and is initially recognised as deferred income. The obligation to surrender permits relating to actual emissions constitutes a liability under IAS 37, and the permits required to settle this liability are measured at fair value.³⁵⁸ Consequently, the tax treatment inherits any inconsistencies present in the accounting treatment, and this inconsistency is significant.

4.4.2. The IFRIC 3 Episode and Its Legacy

There is a clear source of this instability. In 2004, the International Financial Reporting Interpretations Committee (IFRIC), anticipating the launch of the EU ETS, published IFRIC 3 to regulate the accounting treatment of emission allowances. However, following persistent criticism, this interpretation was withdrawn by the IASB in June 2005, almost a year after its publication.³⁵⁹ The criticisms were based on three shortcomings. IFRIC 3 failed to provide any guidance for non-participants purchasing allowances solely for trading or investment purposes, contained no treatment for carbon derivatives used as hedging instruments, and, most damagingly, created an accounting inconsistency.³⁶⁰ This inconsistency arose because, whilst the interpretation required the transfer obligation to be measured at fair value in accordance

³⁵⁷ Tharatee Mookdee and Sheila Bellamy, 'Accounting for Carbon Emission Allowances: An Empirical Analysis' (2017) 2017(3) *European Financial and Accounting Journal* 63, 67, 70; Haseeb Ayaz, 'Analysis of Carbon Emission Accounting Practices of Leading Carbon Emitting European Union Companies' (2017) 3(4) *Athens Journal of Business & Economics* 463, 467-68.

³⁵⁸ Ayaz (n 357) 468; IAS Plus (Deloitte), *IFRIC 3 — Emission Rights* (withdrawn).

³⁵⁹ Madlen Haupt and Roland Ismer, *Emissions Trading Schemes under IFRS — Towards a "True and Fair View"* (Climate Policy Initiative 2011); Ayaz (n 357) 468.

³⁶⁰ Haupt and Ismer (n 359).

with IAS 37 and for movements to be recognised in the profit and loss account, while the allowances held to meet that obligation were treated as intangible assets under IAS 38, with any increases in the value of these assets being recorded in equity rather than in the profit and loss account. Consequently, an increase in the carbon price has led to a loss being reported in the income statement even for a business that holds sufficient free allowances to fully cover its emissions.³⁶¹

With the withdrawal of IFRIC 3, there is no standard to replace it. In accordance with the general rule requiring management to exercise its own judgement in the absence of a specific standard, accounting practices have become fragmented, adversely affecting comparability across the market.³⁶² In response to this inconsistency and the complexity of the government grant approach, many entities have adopted the net liability or cost approach. Under this approach, emission allowances allocated free of charge are recognised at zero or nominal value. This prevents the recognition of deferred income, whilst purchased emission allowances are recognised at their acquisition cost.³⁶³

4.4.3. Divergent National Tax Consequences

Member States have developed differing tax practices based on this uncertain accounting framework. The Milieu study highlights two main dimensions of these differences. The first relates to the timing of recognition. Whilst some jurisdictions tax allowances by taking into account fluctuations in market value during the financial year, based on inventory or market value, others tax them at the time of realisation, considering only the difference between the purchase and sale prices.³⁶⁴ The second concerns the treatment of free allowances and the availability of deductions. Some countries treat grants received free of charge as taxable income with a zero acquisition cost and do not permit any deduction in the event of a return, whilst others treat them as taxable income at market value and only permit a corresponding deduction when the grants are returned or sold; whether the allowance is classified as an amortisable intangible fixed asset or a financial asset determines whether the acquisition cost can be deducted and when it can be deducted.³⁶⁵ These are not profound technical differences. These

³⁶¹ Mookdee and Bellamy (n 357) 68-69; Haupt and Ismer (n 359).

³⁶² Ayaz (n 357) 463-64, 467.

³⁶³ *ibid* 471, 479-80.

³⁶⁴ Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 118.

³⁶⁵ *ibid* 118-20.

differences determine the timing and amount of the tax burden borne by compliant organisations and stem directly from the absence of a common definition of this instrument.

4.4.4. The Private Law Root of the Fiscal Divergence

At this point, the link to the analysis in Chapter 2 is a direct one rather than a thematic one. Whether an emission allowance is treated as an intangible fixed asset for accounting and tax purposes depends on, and is subject to, how that right is classified under private law within the relevant national legal system. The Milieu study demonstrates this dependency in concrete terms. The Polish Accounting Act defines allowances as property rights and intangible fixed assets, whilst the German Federal Ministry of Finance requires that allowances be classified as current assets under civil and commercial law. Thus, the application of IAS 38 in each country operates on the basis of ownership established by national private law.³⁶⁶ As shown in Section 3 financial regulations have harmonised the trading of the allowance whilst leaving its ownership content to national law. The taxation of the allowance highlights the cost of this omission, as the corporate tax and accounting treatment of this instrument cannot be more uniform than the private law classification on which it is based. The financial fragmentation examined here is, ultimately, the private law uncertainty expressed in the language of the balance sheet in Chapter 2.

4.5. Energy Taxation, the Emissions Trading System, and the Border Adjustment

4.5.1. The Energy Taxation Directive and Its Carbon Blind Spot

Value added tax is not the only indirect tax that has an impact on carbon. The Energy Taxation Directive establishes a Union framework for the taxation of energy products and electricity, setting minimum excise duty rates with the aim of ensuring the proper functioning of the internal market.³⁶⁷ In this context, a key limitation of the Directive is that it was not designed as a climate policy instrument.³⁶⁸ As the European Court of Auditors has also noted, in its current form, the Directive taxes energy based on volume rather than environmental impact. As a result, more polluting energy sources are able to retain their tax advantage, and energy taxes

³⁶⁶ Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 84, 86.

³⁶⁷ Council Directive 2003/96/EC of 27 October 2003 restructuring the Community framework for the taxation of energy products and electricity [2003] OJ L283/51; European Court of Auditors, *Energy taxation, carbon pricing and energy subsidies* (Review No 01/2022) 32, para 54.

³⁶⁸ *Tax Management Transfer Pricing Report* (BNA, 2011), 'Groups Urge OECD to Apply Transfer Pricing in Taxing Emissions Permits Trading Profits'.

do not reflect the environmental cost of the emissions they produce.³⁶⁹ Energy taxation and carbon pricing have thus developed along separate paths, and the Directive's blind spot regarding carbon is the starting point for the reform discussed below.

4.5.2. The Overlap with the Emissions Trading System and the Recast Proposal

As both the Energy Taxation Directive and the EU Emissions Trading System (EU ETS) impose a cost on energy consumption or production, the same emissions may, in principle, be subject to two overlapping charges - the national energy tax and the Union-level emission allowance price - which creates a risk of double taxation. The proposed recast of the Directive, presented as part of the 'Fit for 55' package, aims to coordinate the two by basing the energy tax on the energy content and environmental performance of energy products rather than on volume. In this way, the tax will complement rather than duplicate the ETS price signal.³⁷⁰ The explanatory memorandum to the recast directly acknowledges this challenge and emphasises that an effective Union taxation framework must avoid national preferences that lead to distortions in the internal market or double taxation.³⁷¹ Assessing the reform package as a whole, the Court of Auditors considers that, when taken together, the proposals will tax energy use and price greenhouse gas emissions across a broader scope than current legislation, thereby creating a more consistent fiscal framework than the uncoordinated regulation it is intended to replace.³⁷² However, the reform remains a proposal, and the coordination objective has not yet been achieved.

4.5.3. The Carbon Border Adjustment Mechanism

A third instrument aims to address the carbon cost of imports. The Carbon Border Adjustment Mechanism (CBAM) imposes a charge on the embedded emissions of goods imported into the Union from certain emission-intensive sectors and functions as a reflection of the EU ETS. In this way, imported products bear a price equivalent to the carbon price paid by domestic producers.³⁷³ Operating as a regime for reporting purposes only during the transitional phase

³⁶⁹ European Court of Auditors, *Energy taxation, carbon pricing and energy subsidies* (Review 01/2022).

³⁷⁰ Commission, 'Proposal for a Council Directive restructuring the Union framework for the taxation of energy products and electricity (recast)' COM (2021) 563 final, recital 9; European Court of Auditors (n 369) 40, para 67.

³⁷¹ COM (2021) 563 final (n 370) explanatory memorandum.

³⁷² European Court of Auditors (n 369) 40, para 69.

³⁷³ Regulation (EU) 2023/956 of the European Parliament and of the Council of 10 May 2023 establishing a carbon border adjustment mechanism [2023] OJ L130/52, recital 20.

from October 2023, the CBAM entered its definitive phase on 1 January 2026. From this date onwards, authorised CBAM declarants are required to verify the embedded emissions of their imports and surrender CBAM certificates in return.³⁷⁴ The price of these certificates reflects the EU ETS allowance price, and the number to be surrendered is adjusted to reflect the free allocation still granted to Union facilities producing the same goods. In this way, domestic and imported production are brought as close as possible to an equal level.³⁷⁵ The mechanism is calibrated to the phased removal of free allowances. For sectors covered by the scheme, free allowances are reduced annually — by 2.5 per cent each year in 2026 and 2027 — until free allowances are completely phased out and CBAM is fully implemented. This transition is scheduled to be completed in 2034.³⁷⁶

The framework underwent significant improvements shortly before the definitive phase began. The CBAM Omnibus Regulation of 2025 and the implementing decisions of December 2025 introduced a single, volume-based *de minimis* exemption for importers of covered goods amounting to less than 50 tonnes per year. It has set the deadline as 30 September of the year following the delivery date and anticipates that Member States will begin selling certificates for emissions from 2026 imports on 1 February 2027.³⁷⁷

In line with the objectives of this thesis, the most illuminating feature of the CBAM is the legal nature of the certificate it employs. This serves to clarify the analyses presented in the preceding sections. The CBAM certificate is deliberately not an emission allowance. Unlike an EU ETS emission allowance, it is not auctioned, does not trade on a secondary market and is not a financial instrument. Whilst the certificate is a compliance fee purchased directly from a central platform at a fixed price linked to the allowance market, the declarant cannot sell this certificate to another importer or hold it freely. The Regulation permits authorities to reclaim up to one-third of the certificates purchased within a year, whilst cancelling the surplus without compensation.³⁷⁸ This contrast is quite illuminating. Whilst Section 2 states that an allowance

³⁷⁴ Regulation (EU) 2023/956 (n 373) art 5(1); International Carbon Action Partnership, *EU CBAM Enters Compliance Phase and Outlines Path Ahead* (2025).

³⁷⁵ Regulation (EU) 2023/956 (n 373) arts 21(1), 31(1).

³⁷⁶ International Carbon Action Partnership (n 374); World Bank, *State and Trends of Carbon Pricing 2025* (n 168) Box 2.

³⁷⁷ Regulation (EU) 2025/2083 of the European Parliament and of the Council amending Regulation (EU) 2023/956 [2025] OJ L, 2025/2083, recital 3, arts 6(1), 20(1); International Carbon Action Partnership (n 374).

³⁷⁸ OECD, *Tax Treaty Issues Related to Emissions Permits/Credits*, incorporated into the OECD Model Tax Convention by the 2014 Update to the OECD Model Tax Convention (OECD 2014) 1-2, 41; OECD, *Tax Treaty Issues Related to the Trading of Emissions Permits* (Public Discussion Draft, 2011) para 3.

is an instrumental property right that can be held, transferred and used as collateral, and Section 3 states that it is a financial instrument traded on regulated markets, the CBAM certificate is none of these. In designing a new carbon instrument from scratch, the Union has deliberately stripped this instrument of the property and financial characteristics that allowances have acquired.

Thus, the CBAM certificate serves as a counterexample that validates the main thesis of this paper. When the legislator seeks to create a unit that does not possess the nature of property or investment, but is intended solely for regulatory compliance, it will be able to do so. This demonstrates that the property and financial nature of an emission allowance is not an inevitable characteristic of any carbon unit, but rather a result of its design and the market. The international and commercial dimensions of CBAM—its relationship with the Union’s trading partners and the global trading system—are addressed in Chapter 5; what is important here is the financial structure and the legal nature of the instrument it entails.

4.6. Cross-Border Taxation and the OECD Framework

4.6.1. The Problem of Divergent Treaty Characterisation

The fragmentation issues discussed in previous sections are problems that arise within and between national systems. However, the moment an emission allowance is transferred across borders, this issue takes on an international dimension. Because the revenue generated from the transfer of an emission allowance is classified differently depending on the jurisdiction, situations may arise where the same income is subject to taxation under two different categories by two distinct tax systems. Moreover, bilateral double taxation agreements which typically resolve such conflicts were not drafted with carbon instruments in mind. The Organization for Economic Cooperation and Development (OECD), which maintains the Model Tax Convention—serving as a template for the vast majority of bilateral agreements—addressed this issue in a report examining tax treaty matters related to emission permits and credits. This report began as a public consultation draft in 2011, was revised in 2012, and was finalised with the 2014 Update before being incorporated into the Model Tax Convention. This has made the report, unlike most of the soft law materials discussed in other sections of this thesis, a definitive and authoritative guide.³⁷⁹

³⁷⁹ OECD, Tax Treaty Issues (n 378) 12, 41; OECD, *Tax Treaty Issues Related to the Trading of Emissions Permits* (Public Discussion Draft, 2011) para 3.

The report's main conclusion is that revenues derived from the issuance and trading of emission permits and credits generally fall under Article 7 (business profits) or Article 13 (capital gains) of the Model Convention. However, the precise classification depends on the specific circumstances and the treatment adopted under the domestic law of the contracting state.³⁸⁰ In reaching this conclusion, the OECD rejected the application of Article 12 (royalties), arguing that emission permits were designed as goods to be consumed through use, rather than as property or rights that can be leased or licensed in a manner that generates royalties.³⁸¹ However, another notable aspect is that the analysis does not cover every alternative. While the 2011 draft proposed that the remaining Article 21 (other income) should never apply, the final text adopted in 2014 adopted a clearer stance and acknowledged that income derived from permits and credits could fall under Articles 6, 8, or 21 under certain conditions.³⁸² The practical significance of this classification lies in the allocation of taxing rights; since, in the absence of a permanent establishment in the source country, commercial profits are, in principle, taxable only in the country of residence.

4.6.2. The Resolution of Double Taxation

The risk that two states might classify the same income differently is indeed a serious issue. However, the Model Convention includes the necessary mechanism to resolve this problem. In cases where the source state taxes the income in accordance with the Convention, the resident state is obligated to eliminate the double taxation arising under Article 23. It must do so even if it has classified the income differently under its own domestic law and, consequently, applied a different article of the Model Agreement.³⁸³ The resident state's obligation to follow the source state's classification in accordance with the agreement is the element that prevents differences in national classifications from resulting in systematic double taxation. The remaining risk lies in the issue of a fixed place of business. A state in which a non-resident conducts business may claim that the use of an account in that state's national registry constitutes a fixed place of business. However, the more accurate view is that the mere use of the registry does not satisfy the criteria for a fixed place of business or a dependent agent, and

³⁸⁰ OECD, 2014 Update (n 378) 41; OECD, Discussion Draft (n 379) para 5.

³⁸¹ OECD, Discussion Draft (n 379) paras 4-5.

³⁸² OECD, 2014 Update (n 378) 41; cf OECD, Discussion Draft (n 379) para 23.

³⁸³ OECD, Discussion Draft (n 379) para 27.

therefore the use of the registry alone does not subject the non-resident trader to taxation by the source state.³⁸⁴

Although the 2025 Update to the Model Contract is not specifically focused on carbon, it clarifies these issues precisely. This clarification addresses when remote and home-based work constitutes a fixed place of business and addresses the issue of transfer pricing for financial transactions. The guiding principles in this update will affect carbon traders engaged in cross-border activities through electronic record-keeping systems and intra-group financing.³⁸⁵

4.6.3. The Limits of the Guidance and the Voluntary Market

Another guideline related to this topic concerns transfer pricing. When emission allowances or mitigation projects are transferred within a multinational group, the arm's length principle set forth in the OECD Transfer Pricing Guidelines applies. Industry organizations, by exerting pressure on the OECD during the consultation process, have secured confirmation that revenue generated from intra-group permit trading must be allocated in accordance with these generally applicable rules.³⁸⁶ In the context of the Clean Development Mechanism, when a business in one country finances an emission reduction facility in the host country and, as a result, receives certified emission reductions, payments must be made to the cross-border supply chain in accordance with the arm's length standard before credits are distributed within the group. This payment is typically made through a cost-plus-profit margin that reflects the financing, technical risks, and operational functions undertaken by the investing company.³⁸⁷

The cross-border tax treatment of voluntary carbon credits, however, is fraught with even greater uncertainty. Since the voluntary market operates largely outside the scope of public law, and national jurisdictions have not reached a consensus on whether a voluntary credit constitutes a financial instrument, an intangible property right, or a service, businesses that buy and sell such credits across borders cannot reliably predict whether their income will be taxed as capital gains or ordinary business profit, or how the relevant contract terms will be applied. This fragmentation is a concrete reality. For example, the Egyptian Financial Regulatory

³⁸⁴ *ibid*; *Tax Management Transfer Pricing Report* (BNA, 2011).

³⁸⁵ OECD, *The 2025 Update to the OECD Model Tax Convention* (OECD 2025), changes to the Commentary on arts 5 and 9.

³⁸⁶ *Tax Management Transfer Pricing Report* (BNA, 2011), 'Groups Urge OECD to Apply Transfer Pricing in Taxing Emissions Permits Trading Profits'.

³⁸⁷ *Tax Management Transfer Pricing Report* (BNA, vol 16 no 24, 2008) 956-57.

Authority has issued guidelines stating that, depending on the criteria met, a voluntary credit may be classified as a financial instrument or an intangible asset.³⁸⁸ The lack of a mutually agreed-upon classification—defined as a private law issue in Chapter 2 and a financial regulation issue in Chapter 3—reemerges here as a source of cross-border tax risk, exposing traders to disputes and the double taxation that the treaty framework is intended to prevent.

4.7. Comparative Member State Treatment

4.7.1. The Comparative Picture

The claim that financial fragmentation stems from the uncertainty of private law can be tested by comparing it with the concrete implementation of emission rights in Member States. A comparative analysis conducted in the Milieu study, covering Germany, France, the United Kingdom, Poland, and Belgium, also confirms this claim.³⁸⁹ In these countries, precisely because VAT is harmonised, there is a certain degree of convergence in VAT rates. Each applies a reverse charge to secondary market transfers and treats the transaction as a taxable event rather than a primary allocation. Thus, for example, both the German and Belgian systems clearly distinguish taxable secondary transfers from non-taxable issuance.³⁹⁰ However, beneath the surface of harmonised VAT, practices continue to diverge exactly as the thesis predicts.

This difference is most evident in areas where the definition of depreciation is determined by national regulations. In accounting valuation, Germany and Poland record allowances at historical purchase price, France records them adjusted from purchase price to present value, the United Kingdom uniquely records them at fair market value, and Belgium records them based on the entity's choice between purchase price and fair value.³⁹¹ In corporate tax practice, jurisdictions differ regarding whether and when free allowances are taxable and the deductibility of acquisition costs. For example, the United Kingdom accounts for free allowances at nil value, ensuring that their receipt does not give rise to any tax liability, while it accounts for purchased allowances at cost and allows them to be deducted from commercial profits.³⁹² These are not merely technical differences but fundamental ones, and they create

³⁸⁸ IOSCO, *Voluntary Carbon Markets Consultation Report* (n 242) 52.

³⁸⁹ Milieu Ltd, Ecologic and Klimapolitika (n 55) 119, Table 5.

³⁹⁰ *ibid* 81-82.

³⁹¹ *ibid* 119, Table 5.

³⁹² *ibid* 82.

cross-border frictions—such as increased transaction costs, legal uncertainty, and opportunities for tax arbitrage and forum shopping—that an integrated internal market must eliminate.³⁹³

4.7.2. Proposals for Harmonisation

The Milieu study, which documents this discrepancy, proposes a solution at the level where the problem arises. The study recommends that there be coordinated efforts between the Commission's Directorate-General for Climate Action and the Directorate-General for Taxation and Customs Union. It suggests that the treatment of the direct taxation of allowances could be standardised through an amendment to the Interest and Royalties Directive or similar secondary legislation, and proposes that the preparation of a uniform accounting guideline be delegated to a specialised standard-setting body such as the European Financial Reporting Advisory Group (EFRAG).³⁹⁴ Each proposal addresses the financial discrepancy—a symptom of the problem—rather than the underlying cause, which is the lack of a common definition of the allowance in private law. However, adopting each of these proposals could mitigate the practical consequences of this deficiency. The fact that the proposals on the table focus on coordination and standardisation rather than a binding common definition is significant in itself. This confirms that the issue of financial fragmentation is being treated as a problem to be managed in later stages, rather than one to be resolved at its private law source.³⁹⁵

4.8. Conclusion

The taxation of carbon credits confirms the central thesis presented in the previous sections with the most concrete example encountered to date. Although this pattern may now seem familiar, the tax context highlights it particularly clearly; for here, the consequences of the unresolved underlying issue are measured as liabilities and expressed in numerical terms.

Where the Union has been able to achieve harmonisation in the area of value-added tax, it has established a common classification of the allowance as both the provision of services and the transfer of intangible assets, and through the reverse charge mechanism, has provided a coordinated response to the fraud that led to the emergence of the harmonised system. However, even in this area, a complete solution has not been achieved. The reverse charge has remained limited in nature, serving as an optional and temporary fix rather than a structural solution. The

³⁹³ Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 119.

³⁹⁴ *ibid* 179.

³⁹⁵ *ibid* 124-25.

scope of the tax depends not on the instrument itself, but on the status and behaviour of the holder. The line between a taxable compliance instrument and a voluntary credit outside the scope of taxation depends on the characterisation of the instrument's function—a distinction the law does not define anywhere in general terms.

However, where the Union has not harmonised corporate income tax and accounting rules, the application of this allowance varies across national borders. This is because each Member State must establish its tax regime based on the classification of an instrument—which the EU ETS Directive does not define—under its own domestic law. Differences in valuation, timing of recognition, and the deductibility of costs stem directly from this shortcoming. Comparative research clearly demonstrates that beneath the harmonised VAT surface lies a fragmented landscape of direct taxation, and the proposed solution is coordination downstream rather than a solution at the source.

The international dimension reproduces this pattern rather than resolving it. There is no binding multilateral instrument governing the taxation of carbon-related instruments. The international tax framework consists of the OECD Model Tax Convention and Transfer Pricing Guidelines, which become binding only when incorporated into bilateral agreements. Within this framework which ranges from soft law to agreements the OECD has carried out valuable work: it has classified income derived from licenses and credits under the provisions for business profits and capital gains; it has eliminated double taxation by requiring the resident state to follow the source state's classification; and it has applied the arm's-length principle to intra-group transfers — and the inclusion of this analysis in the Model Tax Convention in 2014, uniquely among the international materials examined in this thesis, has rendered the matter settled rather than merely aspirational. However, this guidance is limited to covering compliance instruments traded between treaty parties. The cross-border treatment of voluntary credits remains as uncertain as their legal nature, and there is no instrument that coordinates the various national tax systems into a unified whole. In short, carbon taxation is international only to the extent that bilateral agreements and the OECD's soft law manage friction between national systems, and it is not governed by any harmonised international regime.

There are two further observations to conclude from this section. First, the Carbon Border Adjustment Mechanism examined above serves as an illustrative counterexample to the entire analysis. This mechanism can be characterised as a carbon instrument designed as a deliberately pure and non-tradable compliance fee, stripped of the property and financial characteristics

associated with the permit. This demonstrates that these characteristics stem not from the nature of any carbon unit, but rather from the design of the permit and its market. Another observation is that the fragmentation examined here ultimately amounts to the private law uncertainty described in Section 2 and the regulatory deficiency in Section 3, as expressed in balance sheet terminology. As Manea's explanation of instrumental property rights suggests, a supranational regulatory unit to which no specific property attribute has ever been ascribed at the supranational level must be forcibly fitted into the classical categories of each national system, and this coercion becomes visible in the tax sphere through numerical figures.³⁹⁶ Ultimately, the international coordination and harmonisation mechanisms examined in Chapter 5 must confront this layered fragmentation—private, regulatory, and fiscal—and the absence of any binding international instrument to bridge it.

V. INTERNATIONAL COORDINATION AND HARMONISATION

5.1. Introduction: From Fragmentation to Coordination

The previous three sections have presented a single, cumulative argument. Section 2 demonstrated that the carbon instrument does not constitute a harmonised private law instrument; rather, it functions as an instrumental property right whose content is determined by each national legal system. Chapter 3, in turn, has shown that the Union's financial regulatory framework operates within this uncertainty, but does not eliminate it, and that while harmonising trade in the instrument, it leaves the essence of ownership to national law. Chapter 4 has shown that taxation reflects the same fragmentation from a concrete financial perspective; harmonisation exists only in areas where value-added tax is applied, whereas in other areas, the structure remains fragmented. The resulting picture is one of layered fragmentation: private law, regulatory, and fiscal layers. Each layer, in turn, rests on the unresolved foundation beneath it.

This section examines whether international law can overcome this fragmentation. The carbon market is, by its very nature, a global phenomenon. Credits created under one regime are traded across borders, can be transferred to another regime for compliance purposes, and may be held by multinational companies subject to tax and regulatory obligations spanning multiple jurisdictions. To ensure coordination and compliance, such alignment must occur at the international level. The system can function only if international harmonisation exists. This

³⁹⁶ Manea (n 72) 2.

section aims to examine the primary mechanisms through which such coordination is sought. The market mechanisms under Article 6 of the Paris Agreement, the linking of emissions trading systems, the Carbon Border Adjustment Mechanism and its controversial relationship with international trade law, the position of developing countries, and transnational private ordering evolving alongside public regimes are the primary subjects of examination. The argument put forward is that while each of these mechanisms provides a degree of functional coordination, none of them resolves the underlying uncertainty. The international level, like the regulatory and financial layers that preceded it, manages fragmentation without eliminating it, and does so through soft law, bilateral agreements, and private standard-setting rather than through a binding multilateral instrument.

5.2. The Paris Agreement and Article 6: A Framework for Market Linkage

The international legal basis for cross-border carbon trading is actually provided by Article 6 of the Paris Agreement. The rules for implementing this article were finally finalised at COP29, held in Baku in November 2024, following nine years of negotiations. Article 6 provides for two market-based mechanisms that must be kept separate. Paragraph 2 of this article establishes a decentralised framework under which Parties may engage in cooperative approaches involving the international transfer of emission reductions (ITMOs), provided they comply with robust accounting requirements designed to prevent double counting.³⁹⁷ Article 6.4, meanwhile, establishes a centralised, UN-supervised crediting mechanism—the Paris Agreement Crediting Mechanism (PACM), administered by a dedicated Supervisory Body—which succeeds the Clean Development Mechanism of the Kyoto era and issues its own emission reductions.³⁹⁸ A third element, Article 6.8, provides a framework for non-market approaches such as capacity building and technology transfer and falls outside the scope of the tradable mechanisms addressed in this thesis.³⁹⁹

What COP29 achieved was to make this framework fully operational through a series of decisions that resolved issues that had remained unresolved since 2015, including authorisation

³⁹⁷ Paris Agreement (n 5) art 6(2); UNFCCC, Decision 2/CMA.3 (n 98); Organisation for Economic Co-operation and Development, *Exploring Governments' Efforts to Shape Carbon Credit Markets* (OECD Environment Working Paper No 263, 2025) 66-67.

³⁹⁸ UNFCCC, Decision 4/CMA.6, para 3; OECD (n 397) 68; World Bank, *State and Trends of Carbon Pricing 2025* (n 168).

³⁹⁹ Paris Agreement (n 5) art 6(8).

procedures and the transition of legacy CDM activities to the PACM.⁴⁰⁰ A particularly important aspect from the perspective of private law analysis is the authorisation structure it established. The COP29 outcome document specifies that authorisation operates at three distinct levels—the cooperative approach, the ITMO itself, and participating entities—and clarifies that the host country’s obligation to implement the relevant arrangements only comes into effect upon the first transfer.⁴⁰¹ This structure enables a certain type of market alignment. By standardising the accounting of transferred units, Article 6, paragraph 2, allows for the interconnection of otherwise disparate national systems, permits compliance entities in one jurisdiction to use emission reduction results generated in another jurisdiction, and provides governments with the regulatory certainty needed to finalise bilateral agreements that are beginning to gain traction in the new market.⁴⁰²

However, the implementation of Article 6, rather than eliminating the uncertainty in the area of private law identified in Chapter 2, actually serves to further highlight it. The OECD itself characterises carbon credits as intangible instruments that can be traded, and once authorised, ITMOs and PACM units are purchased by private actors on the secondary market.⁴⁰³ However, the legal existence of the unit remains entirely dependent on sovereign administrative action. Since an ITMO is subject to the relevant regulations of the host state, a subsequent change to the authorisation by that state—such as altering the purpose for which the unit may be used—could effectively nullify the transfer and frustrate the private purchaser’s expectations.⁴⁰⁴ Thus, the ITMO functions precisely like the instrumental property right described in Chapter 2. It emerges as a financialised asset bought and sold by private parties, whose existence and benefits are entirely dependent on international administrative decisions and sovereign accounting. Article 6 provides a framework for market connectivity, but the unit it transfers across borders carries the same uncertain legal character into the international arena.

⁴⁰⁰ UNFCCC, Decision 5/CMA.6 and Decision 6/CMA.6, FCCC/PA/CMA/2024/17/Add.1 (Baku, November 2024), together with the accompanying CMA.6 decisions on Article 6.2 and Article 6.8 finalising the Article 6 rulebook; Osborne Clarke, ‘COP29 Delivers Breakthrough Article 6 Deal for International Carbon Markets’ (2024) <<https://www.osborneclarke.com/insights/cop29-delivers-breakthrough-article-6-deal-international-carbon-markets>> accessed 13 June 2026; OECD (n 397) 55.

⁴⁰¹ UNFCCC, Decisions of CMA.6 finalising the Article 6 rulebook (Baku, November 2024); Osborne Clarke (n 400); OECD (n 397) 55.

⁴⁰² OECD (n 397) 68 (Decision 4/CMA.6, para 3); World Bank, *State and Trends of Carbon Pricing 2025* (n 168).

⁴⁰³ OECD (n 397) 19, 44; Osborne Clarke (n 400).

⁴⁰⁴ OECD (n 397) 65.

5.3. The Linking of Emissions Trading Systems

A second and more direct mechanism for integration is the formal linking of emissions trading systems. This allows emission allowances from one system to be accepted as a compliance requirement in another system. The two systems are linked in a way that when a participant in one system can use a unit issued under the other system to fulfil their own compliance obligations; this practice is based on the mutual recognition of the equivalence of emission allowances.⁴⁰⁵ An example of an established model in this regard is the link between the EU ETS and the Swiss system. This linkage—which has been under negotiation since 2010, was signed in 2017, and has been in effect since 1 January 2020—directly links the two registries, enabling regulated entities to transfer emission allowances between accounts in both systems. Emission allowances issued in one system can be surrendered against emissions in the other systems.⁴⁰⁶

Another major development at this time is the future interconnection of the EU and UK systems. On 19 May 2025, the European Commission and the UK Government announced a Joint Agreement committing to interconnect the EU ETS and the UK ETS. The Council adopted a negotiating mandate in November 2025, and formal negotiations began in January 2026.⁴⁰⁷ The primary driving force behind this link was to ensure interoperability with the carbon border adjustment mechanism. The purpose of a formal link is to create the necessary conditions for mutual exemption from the respective carbon border adjustment mechanisms and to remove the barriers that the CBAM would impose on trade across the English Channel.⁴⁰⁸ The legal structure of such a link is quite complex. Pursuant to Article 25 of the EU ETS Directive, the Union may establish a link only with a mandatory system that imposes an absolute emissions cap. The linkage must be implemented as an international agreement concluded under the approval procedure set forth in Article 218 of the TFEU, which requires the consent of the European Parliament, and is generally concluded as a mixed agreement that is binding on both

⁴⁰⁵ Michael Mehling, 'Linking of Emissions Trading Schemes' in David Freestone and Charlotte Streck (eds), *Legal Aspects of Carbon Trading: Kyoto, Copenhagen and Beyond* (Oxford University Press 2009) 117.

⁴⁰⁶ Michael Mehling, 'Linking of Emissions Trading Schemes' in Freestone and Streck (eds) (n 8) ch 5, 111; European Commission, *Report on the Functioning of the European Carbon Market* COM (2022) 516 final, 33; Stefano F Verde and Simone Borghesi, 'The International Dimension of the EU Emissions Trading System' (n 95) 41.

⁴⁰⁷ Juan Fernando López Hernández, 'Linking the EU and UK emissions trading systems' (EPRS, European Parliament, PE 775873, July 2025).

⁴⁰⁸ International Carbon Action Partnership, *EU and UK Commit to Linking Emissions Trading Systems* (2025); EPRS (n 407).

the Union and the Member States. Furthermore, there is generally a requirement that the linked partner maintain dynamic alignment with evolving EU rules within the framework of the joint governance mechanism.⁴⁰⁹

This connection is particularly illuminating for the purposes of this thesis because of what it does and does not entail. For two emission allowances to be mutually recognised, they must be functionally and regulatory interchangeable. Each must represent a transferable amount of carbon dioxide equivalent in both systems. Nevertheless, they need not have a compatible classification under private law. As noted in the comparative literature, while one of the connected jurisdictions may treat emission rights as full-fledged property rights with all associated protections, the other may regard them merely as administrative allocations. These differences are neither a condition nor a consequence of the connection; they are simply the result of fundamental differences between the legal systems.⁴¹⁰ As long as the registry system infrastructure ensures the secure transfer of property rights and public law delivery rules recognise the foreign unit, the private law uncertainty documented throughout this thesis will not, in and of itself, hinder international market integration. Thus, while the connecting factor coordinates the systems at a functional level, it continues to leave the underlying fragmentation of ownership entirely as it is. This situation serves as a vivid example of the thesis's central claim that the trade in carbon credits has been made operational without the question of their legal nature ever being resolved.

5.4. The Carbon Border Adjustment Mechanism and the World Trade Organization

If “linkage” represents coordination through agreement, the Carbon Border Adjustment Mechanism represents coordination through unilateral enforcement and is the most legally contentious of all the mechanisms examined in this thesis. The design of the CBAM, as analysed in Chapter 4, imposes a levy on imports that reflects the price of EU ETS allowances. However, the international dimension of the mechanism, as discussed in this chapter, is a source of serious legal conflicts on two levels—within the Union's own legal order and within the global trading system.

The case under domestic law is an action for annulment pending before the Court of Justice. In the case *Republic of Poland v European Parliament and Council* (Case C-512/23), filed on 8

⁴⁰⁹ International Carbon Action Partnership (n 408).

⁴¹⁰ Mehling (n 405) 117.

August 2023, Poland seeks the annulment of the CBAM Regulation on a single ground: that “the measure in question is essentially of a fiscal nature and, therefore, should have been adopted pursuant to Article 192(2) TFEU, which requires unanimity in the Council, rather than Article 192(1), which permits qualified majority voting.”⁴¹¹ The case is still pending; no decision has yet been rendered, and the application of the Regulation has not been suspended pending the outcome.⁴¹² This objection is significant from the perspective of this argument, regardless of its procedural outcome; for at the level of constitutional authority, it reflects the definitional issue repeated in every section: The question of whether the CBAM is “fiscal” or “environmental” is a form of uncertainty similar to the question of whether an allowance constitutes “property” or an “administrative grant,” and here this uncertainty is significant enough to form the basis of an objection to the legality of the entire regulation.

The external challenge arises under World Trade Organization (WTO) law. The compatibility of the CBAM with the WTO regime is debatable. Critics argue that it could violate GATT’s non-discrimination obligations — most-favoured-nation treatment under Article I and national treatment under Article III — while the Union argues that the mechanism is consistent because it precisely reflects the domestic carbon price and thus provides treatment no less favourable than that accorded to domestic products comparable to imported goods. This rationale is explicitly stated in the CBAM Regulation.⁴¹³ This dispute is no longer merely a theoretical issue. On 12 May 2025, the Russian Federation requested WTO dispute consultations regarding an alleged export subsidy arising under the “CBAM Package” and the EU ETS, citing the provisions of the GATT, the Agreement on Subsidies and Countervailing Measures, and the Agreement on Import Licensing. The Union rejected these consultations on 22 May 2025, and although no panel has been established on the matter, the case remains in the consultation phase.⁴¹⁴

Other countries, however, have voiced their objections without initiating formal proceedings. India has filed formal objections on numerous occasions in WTO committees; Brazil has

⁴¹¹ EPRS (n 407); Council Directive 2003/87/EC (n 54) art 25; Consolidated Version of the Treaty on the Functioning of the European Union [2016] OJ C202/47, art 218; Mehling (n 405) 131.

⁴¹² Case C-512/23 *Republic of Poland v European Parliament and Council of the European Union* (action brought 8 August 2023) [2023] OJ C338/14.

⁴¹³ *ibid*; EY, *Polish Government Seeks Annulment of CBAM Regulation in European Court of Justice* (2023) <https://www.ey.com/en_gl/technical/tax-alerts/polish-government-seeks-annulment-of-cbam-regulation-in-european-court-of-justice> accessed 27 April 2026.

⁴¹⁴ Gracia Marín Durán, ‘Securing Compatibility of Carbon Border Adjustments with the Multilateral Climate and Trade Regimes’ (2023) 72(1) *International and Comparative Law Quarterly* 73, 90-91.

submitted observations to the Council for Trade in Goods, citing the principle of common but differentiated responsibilities; and China has raised the issue in the Committee on Trade and Environment without filing a complaint.⁴¹⁵ The status of these objections—one dispute at the annulment stage, another at the consultation stage, and a series of formal objections—is revealing in and of itself. The legitimacy of the Union’s flagship border instrument is being tested simultaneously from both within and without, and the outcome of both disputes remains uncertain. The fact that the instrument’s legality depends on how it is characterised in both forums reaffirms that the carbon instrument’s resistance to classification is not merely a matter of doctrinal curiosity but also a real source of legal risk.

5.5. Developing Countries and the Equity Dimension

The debate surrounding the CBAM is most intense in terms of its impact on developing countries, and this situation brings to the forefront the issue of equity—which both Article 6 and the border adjustment mechanism must address. This tension is of a principled nature. By applying a uniform carbon price equivalent to that of the EU to imports regardless of the exporting country’s level of development, the CBAM contradicts the fundamental principle of the United Nations Framework Convention on Climate Change (UNFCCC), which acknowledges that countries assume different obligations based on their historical contributions and capacity to act.⁴¹⁶ The practical burden is distributed unevenly. While the greatest absolute risk falls on large economies such as Russia, China, and Türkiye, the most serious relative macroeconomic risk—measured in terms of export revenue and employment—falls on developing economies such as Mozambique, Zimbabwe, Cameroon, Morocco, and Tajikistan. These countries’ exports face high effective CBAM duties because they lack domestic carbon pricing and low-carbon technologies that would reduce their embedded emissions.⁴¹⁷

To bring this mechanism into line with the CBDR-RC principle, academics and some members of the European Parliament have called for structural reforms. For example, granting full exemptions to the least developed countries and small island developing states, and redistributing CBAM revenues to finance decarbonisation and technology transfer in the

⁴¹⁵ *European Union and its Member States — Carbon Border Adjustment Mechanism* (DS639), Request for Consultations by the Russian Federation (WT/DS639/1, 12 May 2025); World Trade Organization, 'DS639: European Union and its Member States — Carbon Border Adjustment Mechanism' (in consultations) <https://www.wto.org/english/tratop_e/dispu_e/cases_e/ds639_e.htm> accessed 17 June 2026.

⁴¹⁶ International Institute for Sustainable Development, *State of Border Carbon Adjustments 2025* (2025) 18.

⁴¹⁷ Marín Durán (n 414).

affected countries.⁴¹⁸ Consequently, the challenge for developing countries is twofold: a market access barrier in the form of a border tax, and a deeper challenge in establishing the registration infrastructure, measurement capacity, and legal frameworks necessary to participate in the Article 6 market on equal terms. Türkiye's response—as one of the countries significantly affected by this situation—demonstrates how the Union's border mechanism can incentivise a third country to establish a full carbon pricing system compatible with the EU model.

5.5.1. A Third-Country Case Study: Türkiye's Climate Law

No other country has demonstrated the coordinating power of the Union's carbon instruments as clearly as Türkiye. In 2025, Türkiye enacted a comprehensive climate law that closely modelled the EU system and was largely shaped by the potential implications of the CBAM. Since the European Union accounts for approximately half of Türkiye's exports, the EU's CBAM has served as the primary catalyst accelerating the country's climate policy. This led both to the earlier ratification of the Paris Agreement and to the establishment of a domestic carbon price designed to protect its heavy industry from fees that would be levied at the EU border.⁴¹⁹ This process culminated in Türkiye's first Climate Law (Law No. 7552), which was adopted by the Grand National Assembly of Türkiye on 2 July 2025, and published in the Official Gazette on 9 July 2025. This law establishes the binding legal framework for a national emissions trading system to support the country's net-zero target.⁴²⁰

The structure of the law reflects the EU Emissions Trading System (EU ETS) in terms of its fundamental characteristics. The law establishes a national emissions trading system—operated as a market by Enerji Piyasaları İşletme A.Ş. (EPIAŞ)—along with a national allocation plan and market stability mechanisms. The law requires operators to obtain greenhouse gas emission permits from the General Directorate of Climate Change and, in conjunction with this, establishes a Carbon Market Board (Karbon Piyasası Kurulu) chaired by the Minister, which has authority over policies regarding the national allocation plan, free allocation, auctions, balancing limits, and the international carbon market.⁴²¹ The system is

⁴¹⁸ Guilherme Magacho, Etienne Espagne and Antoine Godin, 'Impacts of the CBAM on EU Trade Partners: Consequences for Developing Countries' (2024) 24(2) Climate Policy 243.

⁴¹⁹ Marín Durán (n 414).

⁴²⁰ İzzet Arı, *Carbon Pricing in Emerging Economies: Challenges and Opportunities for Türkiye* (Routledge 2025) 55-56, 84, 101.

⁴²¹ İklim Kanunu (Climate Law) No 7552, adopted 2 July 2025, *Resmî Gazete* (Official Gazette) No 32951, 9 July 2025; International Carbon Action Partnership, *Türkiye Adopts Landmark Climate Law, Paving the Way for a National ETS* (2025).

intended to be phased in gradually. A pilot phase precedes full implementation, and operators are granted a three-year transition period during which they must obtain their emission permits. This period may be extended by up to two additional years by decision of the Carbon Market Board.⁴²² The law also authorises the establishment of a Türkiye-specific Carbon Border Adjustment Mechanism and delegates its scope and procedures to the Ministry of Trade. Furthermore, by granting the Carbon Market Board the authority to set policies regarding the import and export of international carbon credits, the draft regulation accompanying the law envisions future connectivity with foreign systems—such as the EU ETS—through mutual recognition and electronic inter-system links.⁴²³

However, the most significant provision for the purposes of this discussion is the law’s definition of the allowance itself. This is because the Turkish legislature directly addressed the issue of legal character—which the EU ETS Directive had left open—and resolved it in a manner that fully exemplifies the instrumental property thesis set forth in Chapter 2. Article 2 defines an allowance as a transferable, book-entry right granting the right to emit one metric ton of carbon dioxide equivalent over a specified period.⁴²⁴ This definition is functional rather than ontological. It specifies what the holder can do with the unit but does not classify it under any classical category of property. More importantly, the law intentionally restricts the property rights that the unit would otherwise carry. Article 9 provides that allowances are not subject to the Public Procurement Law and—most importantly—cannot be the subject of security agreements. The protection against attachment provided by the law applies not to the emission rights themselves, but to the assets held in the trading system’s default guarantee account.⁴²⁵ Consequently, the Turkish emission right is, by explicit legal design, a transferable and fungible asset, and the possibility of its use as collateral has been eliminated by the instrument that created it.

This is the functional characteristic of Chapter 2 as expressed in the legal text. In the EUA analysis, while the conditional nature of the emission allowance—shaped by the regulatory

⁴²² İklim Kanunu No 7552 (n 421) arts 9(1), 9(2), 9(3), 10(1)(a); art 2(1)(ü) (defining the market operator as EPIAŞ); CMS, *Türkiye’s New Climate Law* (2025) <<https://cms.law/en/tur/legal-updates/tuerkiye-s-new-climate-law-an-important-step-towards-carbon-governance-and-economic-transformation>> accessed 13 June 2026.

⁴²³ İklim Kanunu No 7552 (n 421) arts 8(1)(ç), 10(1)(a)(2); Çakmak, *The Introduction of Türkiye’s First Climate Law and National Emissions Trading System* (2025) <<https://cakmak.av.tr/en/the-introduction-of-turkiyes-first-climate-law-and-national-emissions-trading-system/>> accessed 13 June 2026.

⁴²⁴ İklim Kanunu No 7552 (n 421) art 2(1)(cc).

⁴²⁵ İklim Kanunu No 7552 (n 421) arts 9(8), 9(9).

authority—must be inferred from the gap in the EU ETS Directive and the Court of Justice’s reserved stance on this matter, Turkish law explicitly states this in the text of the statute. Accordingly, the allowance has the character of property in terms of its holding and transfer. However, its content—including the collateral function, which Chapter 2 shows to be jurisdictionally contingent—is defined, limited, and partially nullified by the regulatory regime that governs it. Turkish law confirms this thesis from an unexpected angle.

A sovereign third state that designed the carbon market based on fundamental principles and possessed the freedom to define emission allowances as it saw fit chose neither to declare them ordinary property nor to leave their nature undefined. Instead, it defined them functionally and then eliminated certain elements of ownership through legislation. This is the clearest possible evidence that the property status of a carbon instrument is a matter of regulatory design rather than an inherent legal characteristic. This situation also confirms the coordinating power of the Union’s instruments. The CBAM has compelled a sovereign state to almost entirely replicate the EU’s carbon pricing architecture and, through unilateral economic pressure, has achieved a level of regulatory alignment that no binding international agreement could have achieved. In contrast, the private law nature of the Turkish emission allowance has ultimately remained within the jurisdiction of national law, just as in the European model.

5.6. Private Ordering as Transnational Harmonisation

In addition to these public mechanisms, a transnational system of private ordering has emerged to provide the coordination that public law cannot ensure. As shown in Chapter 3, the voluntary carbon market falls almost entirely outside the scope of EU financial regulation, and the international public framework extends to this market only indirectly. A dense network of private standard-setting bodies has established itself in this field. The “Integrity Council for the Voluntary Carbon Market” and its “Core Carbon Principles,” along with the “Voluntary Carbon Markets Integrity Initiative” and its “Claims Codes” (Claims Code), together with the contractual framework provided by ISDA documents and the listing standards of exchanges, serve a cross-border quasi-regulatory function by establishing the quality criteria, disclosure standards, and contractual terms that underpin the operation of the global voluntary market.⁴²⁶ This private ordering achieves a genuine level of harmonisation. It standardises units and

⁴²⁶ IOSCO, *Good Practices for Voluntary Carbon Markets* (n 137); IOSCO, *Compliance Carbon Markets Consultation Report* (n 189).

practices across different jurisdictions in a way that no single legislative body could achieve, and it does so with a speed and level of technical detail that public regulations rarely attain.

However, the limits of this private ordering are precisely those set forth in Chapter 3. These organizations have no legislative authority and cannot impose penalties; they cannot mandate reporting across the entire market, nor can they bind actors who refuse to participate. The standards are binding only on the parties that accept them, and the legal enforceability of their norms ultimately depends on the same national private law that documents the fragmentation of this thesis. UNIDROIT's work represents a partial exception and the most promising development, as its draft principles on verified carbon credits aim to provide the property framework that the market lacks—not at the level of individual contracts, but at the level of harmonised private law principles. While this confirms that a VCC can be the subject of property rights, it defers the specific content of these rights to applicable domestic law.⁴²⁷ In short, private ordering coordinates the behaviour of market participants but cannot resolve the legal nature of the instrument they trade. This represents the harmonisation of practices based on incompatible legal foundations and further confirms, from another perspective, that the coordination provided at the international level is functional rather than fundamental in nature.

5.7. Conclusion: The Limits of Coordination

In this section, the mechanisms through which the international order has sought to overcome the layered fragmentation documented in previous sections have been examined, and a consistent pattern has emerged across all of them. Although Article 6 of the Paris Agreement, which entered into force after COP29, provides a standardised calculation framework that enables market linkage, the unit transferred under this article retains the nature of an instrumental property right subject to the authorisation of the competent sovereign authority. The linking of emissions trading systems ensures functional substitutability among the systems while preserving their differences by leaving their private law classifications intact. The Carbon Border Adjustment Mechanism (CBAM) ensures coordination through coercion, but its legitimacy is being debated both before the Court of Justice and within the World Trade Organization, and this debate in both forums is based on the same issue of characterisation that pervades the entire argument. The position of developing countries—exemplified by Türkiye's wholesale adoption of a system compatible with the EU—demonstrates coordination achieved

⁴²⁷ UNIDROIT Working Group on the Legal Nature of Verified Carbon Credits (n 107) paras 57-58, draft Principles 3(1) and 3(4).

through economic pressure rather than through a negotiated agreement. The transnational private ordering of the voluntary market, meanwhile, ensures the harmonisation of practices based on an incompatible legal foundation.

The common thread is that, just as EU-level regulation and national-level taxation have failed to resolve this issue while operating within an uncertain framework, so too has coordination at the international level. There is no binding multilateral instrument that defines the private law nature of the carbon instrument, harmonises its regulatory treatment, or standardises its taxation. The international layer consists of soft law, bilateral agreements, unilateral enforcement, and the establishment of private standards, and each of these manages the situation without eliminating fragmentation. This is not due to a lack of effort. Rather, it is a structural consequence of the foundation laid in Chapter 2. A mechanism whose ownership status has been intentionally left to national law cannot be harmonised from the top down, and the most that international coordination can achieve is to make the fragmented system functional. Whether this is sufficient and what a more lasting solution would require is the question the conclusion will address.

VI. CONCLUSIONS AND RECOMMENDATIONS

6.1. Synthesis: The Carbon Instrument as Instrumental Property

This thesis began with a working title derived from its proposal — the legal nature, financial regulation and taxation of carbon certificates — but the analysis that followed reframed the research. The central question is not, in the ontological sense, *what* a carbon instrument is — a question that occupies a large part of the literature — but rather how private law rules, financial regulations and taxation *regulate* it. This reframing is not a step back from the issue of legal nature; on the contrary, it is the only way to answer this question. For the fundamental finding of this thesis is that the legal nature of a carbon instrument cannot be expressed in any abstract terms. This is because the instrument's content is functionally constituted and is provided for, shaped and limited by the regulatory regime and national legal system within which it operates.

The framework that addresses this is Manea's concept of 'instrumental property'. This concept argues that, for private property to function as an instrument of regulation, it must be understood as a distinct category defined by the regulatory regime's public policy objectives and the

specific context in which rights operate.⁴²⁸ The components of the right to property — exclusion, transfer and use — in the case of the carbon instrument, are shaped primarily by regulatory objectives and modified according to context, rather than being predetermined by general property law.⁴²⁹ Yliheljo's complementary analysis highlights the same phenomenon as 'variability'. The legal status of an emissions unit holder is a combination of private law, climate law and financial market regulations. This results in a status that is variable across personal, temporal and spatial dimensions and lies at the intersection of these three areas of law.⁴³⁰ When these frameworks are considered together, they shed some light on why the carbon instrument has resisted classification. The issue is not that the correct answer has not yet been found, but rather that there is no single abstract answer to be found. For the content of this right, by its very design, is conditional in nature.

Building on this foundation, the thesis has followed a single, cumulative line of argument across four layers. The synthesis of its findings can best be described as the spread of a single unresolved issue into increasingly concrete areas. Chapter 2 laid the groundwork. Across Kyoto units, EU emission allowances, instruments under Article 6 of the Paris Agreement and voluntary carbon credits, a carbon instrument is an instrumental property right whose ownership content is left to national law. The recurring structural feature observed from AAUs to ITMOs and voluntary credits represents the situation referred to in this chapter as the 'risk of sovereignty transfer'. The fact that an economic right under private ownership is contingent upon the continuous fulfilment of sovereign public obligations means that the legal certainty of the right holder's position is, in effect, held hostage to the behaviour of states. Chapter 3 has demonstrated that the financial regulatory framework — MiFID II, EMIR and MAR — provides a layer of public market discipline that private law alone cannot provide, yet operates within a fragile framework without resolving the underlying uncertainties. As Gorzelak also noted, emission allowances have been classified as financial instruments not because of any implications regarding their legal status, but due to the need to subject the market to supervision. As the Milieu study also confirms, even a definition at EU level would lead to the meaning and scope of the rights attached to them being determined within the framework of national law.⁴³¹ This section has also revealed an irony that serves as a bridge to financial analysis. This irony lies in the fact that it was neither property law nor financial regulation that first compelled the

⁴²⁸ Manea (n 72) 2.

⁴²⁹ Manea (n 72) 2, 52.

⁴³⁰ Yliheljo (n 68) 45, 74.

⁴³¹ Gorzelak (n 26) 381; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 186.

Union to define emission allowances positively as the transfer of intangible property provided through a service. Rather, it was taxation, driven by the pressure created by carousel fraud.

Chapter 4 has once again demonstrated that taxation reproduces, in the most concrete way, the very fragmentation addressed in the thesis. Despite the harmonisation of VAT practices, it is evident that even in this context, taxation is linked to the holder rather than the instrument. An analysis of the taxable-person threshold, conducted through the Court's case law on economic activity, has shown that the same allowances may or may not be subject to tax depending on whether the owner is an occasional private property owner or an organised, profit-seeking trader. Beneath the surface of the harmonised VAT, corporation tax and accounting continue to be fragmented across national borders. Since the treatment of emission allowances is based on each Member State's own private law classification, the tax discrepancy ultimately amounts to private law uncertainty expressed in the language of the balance sheet. Chapter 5 has demonstrated that international coordination manages this fragmentation—rather than eliminating it—by examining issues such as the mechanisms under Article 6, the interconnection of trading systems, border adjustments and transnational private ordering. The aim of international coordination can, in fact, be interpreted not as eliminating fragmentation, but as finding a middle ground to manage the situation. This is because there is no binding multilateral instrument that defines the private law nature of this instrument, harmonises its regulatory treatment or standardises its taxation. The resulting picture is one of layered fragmentation. Private law, regulatory, fiscal and international layers; each layer rests upon the unresolved foundation beneath it.

6.2. The Reframing and the Validation of the Hypotheses

This reframing of the concept of 'legal nature' into 'private law classification and governance' enables a nuanced assessment of the thesis's three original hypotheses. Each hypothesis is validated through analysis.

The first hypothesis posits that the uncertainty surrounding the legal classification of carbon certificates hinders regulatory and tax harmonisation. This hypothesis has been comprehensively validated and, in fact, constitutes the thesis's first central, proven claim. Every stage of the analysis has revealed a concrete outcome stemming from the unresolved private law basis. Three findings emerge: the failure of the financial framework to address the essence of ownership; the fragmentation of direct taxation and accounting in line with differing national

classifications; and the absence of any international instrument capable of harmonising what has never been defined. This fragmentation is not accidental but causal, and stems directly from a lack of common classification.

The second hypothesis concerns the idea that a more coherent EU financial regulatory framework would enhance the effectiveness of carbon trading markets. It has been only partially confirmed, and this limitation is significant. Chapter 3 has demonstrated that the financial framework delivers tangible benefits. Examples of these benefits include market discipline, transparency, the prevention of abuse and the orderly trading of derivatives. However, it has also revealed that this regulatory harmonisation operates at the level of trading behaviour and cannot fill the gap regarding the inviolability of the ownership basis. Consequently, a more harmonised financial framework may improve market functioning, but on its own it will fall short of resolving the underlying uncertainty. For this uncertainty is a matter of private law rather than market regulation. The hypothesis holds true, but the caveat that financial harmonisation addresses the symptom rather than the cause of the problem will continue to retain its significance in this context.

The third hypothesis is that tax coordination is of vital importance for the efficiency and fairness of international carbon markets. This hypothesis has been confirmed, and the analysis seeks to explain the reason for this. Chapter 4 demonstrates that unharmonised direct taxation and the accounting of emission allowances further exacerbate the cross-border friction, legal uncertainty and arbitrage opportunities that an integrated market aims to eliminate, whilst Chapter 5, meanwhile, demonstrates that the international tax layer is based on soft law, which becomes binding only through bilateral agreements, and that this situation renders the cross-border treatment of instruments subject to less regulation than harmonisation tools — namely, voluntary credits — more uncertain. Consequently, tax coordination is of vital importance not as an end in itself, but because the fiscal layer is the area where the fragmentation of private law creates the most measurable inefficiencies and the most obvious inequalities.

When these three verified hypotheses are assessed together, it becomes easier to answer the four research questions set out at the beginning of the thesis.

The answer to the first question—concerning how carbon certificates are classified under EU and international law—is that they are not classified according to any uniform rule, but are structured as instrumental property, the content of which is determined by each national system.

The second question concerns how they are regulated as financial instruments, and the answer is that whilst their trading is comprehensively regulated, their nature as property remains unaltered.

The third question examines which taxation challenges and uncertainties have arisen. The answer to this is that, whilst VAT is harmonised, direct taxation and accounting are found to be fragmented according to national private law classifications.

The fourth question concerns which international considerations must be taken into account to integrate carbon markets across different jurisdictions. This can only be resolved if integration is achieved through functional-level linkages and via Article 6. However, there remains no binding instrument to resolve the underlying fragmentation, and this situation is being managed rather than eliminated.

6.3. Recommendations

The recommendations set out below focus on the root cause of the problem rather than the symptoms. These recommendations are based on the following observation made throughout this thesis: Coordination mechanisms implemented at lower levels — such as financial regulation, taxation or international relations — can manage, but cannot eliminate, the fragmentation arising from the absence of a common body of private law. The recommendations are arranged from the most fundamental to the most specific and are directed, in turn, at the private law, financial and international levels.

6.3.1. The Private-Law Layer: A Harmonised Functional Characterisation

The first and most important recommendation is to continue efforts to harmonise at the level of private law through a functional and content-referencing model, as exemplified in UNIDROIT's Principles on Verified Carbon Credits. What this model promises is that it does not force the carbon instrument into a pre-existing category, but rather, whilst confirming that it may be the subject of property rights, it defers the specific content of these rights to applicable domestic law. This is precisely the structure required by the framework of instrumental property.⁴³² This is a rare reform that addresses uncertainty at its source without requiring any

⁴³² UNIDROIT Working Group on the Legal Nature of Verified Carbon Credits (n 107) draft Principles 3(1) and 3(4).

legal system to abandon its own doctrine of property. It is important that the UNIDROIT studies explicitly cover the issues of substitutability, security and insolvency, which this thesis has repeatedly identified as the least resolved and most significant problems. For, as the analysis of security and insolvency in Chapter 2 demonstrates, it is precisely these issues that are subject to jurisdictional authority and remain largely unresolved.⁴³³ For this reason, the thesis recommends that the UNIDROIT Principles be adopted by national legislative bodies following their adoption and, where possible, be endorsed at EU level as a reference framework for the treatment of carbon instruments under private law.

Here, it is essential to address a common objection that is perceived as an obstacle to the harmonisation of property law at EU level. The principle set out in Article 345 of the TFEU—that the Treaties shall in no way prejudice the rules governing the system of property ownership in the Member States—is crucial in this context. It might be thought that this provision prevents the creation of a European private law on carbon instruments. However, this is not the case. As explained in the Milieu study, the Court of Justice interprets Article 345 as an expression of the neutrality of the Treaties regarding Member States' systems of property ownership. Building on this interpretation, commentators have argued that the provision confers no exclusive competence over property law on either the Union or the Member States, and therefore does not constitute an obstacle to the development of a European property law.⁴³⁴ Consequently, the restriction on harmonisation is political rather than constitutional in nature. This confirms that this is not a matter of competence, but one of political will. This reframing of the obstacle is a contribution of the thesis itself. The reason why carbon instruments have not been given the status of harmonised private law is not that the Union lacks the competence to do so, but rather, in the words of the Milieu study, that the political will for the harmonisation of property law has remained unclear.⁴³⁵

6.3.2. The Fiscal Layer: Coordinating Direct Tax and Accounting

The second proposal concerns the financial dimension, where coordination is both most needed and most easily achieved, and where the Union's sphere of competence is undisputed. The Union should act in accordance with the proposals set out in Chapter 4. It is necessary to

⁴³³ IOSCO, *Voluntary Carbon Markets Consultation Report* (n 242) 58; UNIDROIT (n 107).

⁴³⁴ Consolidated Version of the Treaty on the Functioning of the European Union [2016] OJ C202/47, art 345; Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 186.

⁴³⁵ Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 185.

standardise the direct tax treatment of emission allowances by ensuring sustainable cooperation between the units within the Commission responsible for climate policy and taxation, and by amending the relevant secondary legislation. To ensure that the treatment in Europe does not itself become a new source of cross-border differences, it is recommended that the development of uniform accounting guidelines be delegated to a specialist standard-setting body such as EFRAG, whilst ensuring compliance with international accounting standards.⁴³⁶ Whilst these measures will not eliminate the uncertainty in the field of private law, they will limit its financial consequences — namely the differing valuation, timing and deductibility rules addressed in Chapter 4. Furthermore, these measures fall within the Union's established sphere of competence in matters of taxation and the internal market. A similar proposal could be made for value added tax. The optional and temporary reverse charge mechanism, which has been extended on numerous occasions, should be placed on a permanent and uniform footing, and the residual risk created in Member States that refuse to adopt it due to its optional nature should be eliminated.

6.3.3. The International Layer: From Soft Law Toward Binding Coordination

The third proposal addresses the international level. The analysis in Chapter 5 has shown that coordination at the international level is based on soft law, bilateral agreements and ad hoc standard-setting processes, none of which are binding. As noted in the literature on interconnection, regulations lacking the binding force of a formal commitment can remain functional only as long as the parties deem them appropriate. This situation, however, leaves interconnected markets constantly exposed to sudden and destabilising adjustments.⁴³⁷ For this reason, the thesis proposes that the medium-term objective of international coordination should be a binding structure — be it a multilateral framework or a network of treaty-based linkages — capable of providing the stability that soft law coordination cannot structurally ensure. The newly enacted Article 6 framework and the consolidation of registration and accounting standards that it is beginning to require form the natural foundation upon which such a binding structure could be built. Particularly for developing countries, such a framework must incorporate the equity considerations set out in Chapter 5 — namely, differentiated treatment and capacity-building, as required by the principle of common but differentiated

⁴³⁶ Milieu Ltd, *Ecologic and Klimapolitika* (n 55) 175, 188.

⁴³⁷ Matthew Ranson and Robert N Stavins, 'Linkage of Greenhouse Gas Emissions Trading Systems: Learning from Experience' (2016) 16(3) *Climate Policy* 284, 285.

responsibilities. In this way, integration will not become a barrier for those states that require participation in the global market.

6.3.4. The Reform Window

Building on the timing of these proposals, a further comprehensive proposal could be put forward. At the time of writing, the Union's carbon market is undergoing an active reform process; the Commission having tabled a proposal to revise the market stability reserve in April 2026 and a comprehensive review of the emissions trading system being expected to follow by July 2026.⁴³⁸ Such a reform opportunity presents a suitable chance not only to address the market design issues currently dominating the agenda, but also to tackle the specific legal foundations which, as this thesis demonstrates, underpin them. This opportunity to finally define this instrument in a consistent manner must not be allowed to go to waste.

6.4. Original Contribution

The contribution of this thesis is, first and foremost, integrative in nature. Whilst the existing literature tends to examine the carbon instrument from a single perspective—be it in the context of property theory, financial regulation, tax law or climate governance—this thesis has analysed all four together and demonstrated that they are different aspects of a single problem. The instrumental-property framework, applied across all layers—private law, regulation, public finance and international law—reveals a single unresolved question that permeates each of them; this permeation only becomes apparent when the layers are examined as a whole.

The thesis also makes several further specific contributions. It extends the instrumental-property framework to instruments and topics to which it had not previously been applied. These include Article 6 units under the Paris Convention, where the nature of private law is identified as an unaddressed gap; the cross-border tax treatment of emission allowances; and the underlying accounting layer of the tax. The thesis demonstrates that, as the fiscal counterpart of instrumental property, the holder's tax status depends on the holder's characteristics rather than on the instrument itself. The study presents the Carbon Border Adjustment Mechanism as an instructive counter-example. This mechanism is a carbon instrument designed as a

⁴³⁸ European Commission, 'Proposal to amend the Market Stability Reserve Decision' (1 April 2026); European Parliamentary Research Service, *Revision of the EU Emissions Trading System* (Briefing PE 782615, 2026) (comprehensive ETS assessment and MSR review expected by July 2026 under the 2026 Commission Work Programme).

compliance fee, stripped of the proprietary and financial characteristics acquired by the allowance, and intentionally not tradable. This demonstrates that the characteristics in question are a matter of design rather than an inherent feature of any carbon unit.⁴³⁹ The study reframes the apparent constitutional obstacle created by Article 345 of the TFEU as a political constraint rather than a legal one. Furthermore, it uses Türkiye's Climate Act as an example that confirms this framework from an unexpected angle. A sovereign legislature, possessing the freedom to characterise an emission right as it sees fit, has chosen to define it functionally and then to restrict its property-related elements by statute. Türkiye has achieved this by denying the emission right the status of a security and excluding it from the scope of general law relating to public procurement. In doing so, it has explicitly set out in the text of the law the conclusion drawn by the EU's analysis of the emission right.⁴⁴⁰

6.5. Limitations and Avenues for Future Research

The findings of this thesis are subject to certain limitations, which identify the most promising avenues for future research. The comparative analysis has been limited to a small group of Member States selected due to the availability of reliable sources — primarily Germany, France, Poland, Belgium and, for the purposes of comparison, the United Kingdom. A more comprehensive comparative study, covering in particular the new Member States and developing systems outside the Union, would test the generality of the fragmentation thesis. The analysis is doctrinal and legal in nature rather than empirical, and has not sought to quantify the economic cost of the fragmentation it describes. An economic study of transaction costs, arbitrage opportunities and risk premiums attributable to private law uncertainty would provide a valuable complement to the legal argument. Furthermore, as this is a rapidly evolving field in which certain aspects remain unresolved, the thesis was inevitably written at a specific point in time.

These unresolved aspects define the research agenda opened up by this thesis. The most pressing of these relates to the UNIDROIT Principles on Verified Carbon Credits. The Working Group held its eighth session in April 2026 but did not finalise the instrument at that stage; a ninth and final session is scheduled for 19–21 October 2026, after which the draft Principles are expected to be submitted to the Governing Council for approval by December 2026,

⁴³⁹ Regulation (EU) 2023/956 (n 373) recital 49, art 23(2).

⁴⁴⁰ İklim Kanunu No 7552 (n 421) arts 2(1)(cc), 9(8), 9(9).

followed by a public consultation. The content of the final Principles and how they are received by national legislative bodies will determine whether the private law harmonisation proposed in this thesis is actually achieved. Future work should assess the adopted document in the light of the instrumental property framework developed here.⁴⁴¹ The treatment of cancellation procedures is another particularly fruitful topic for discussion. The draft Principles provide that a cancelled credit — whether through reversal, termination or withdrawal — ceases to be the subject of a property right. This provision operationalises, from a private law perspective, the sovereignty-delivery risk addressed in this thesis, and its interaction with security rights and insolvency merits close scrutiny.⁴⁴² Beyond UNIDROIT, there are current developments that require analysis as they mature: the outcomes of the ongoing challenges regarding the Carbon Border Adjustment Mechanism (CBAM) in Case C-512/23 before the Court of Justice and in Dispute No. DS639 at the World Trade Organisation are highly critical. Both focus on the classification issue identified in this thesis. The first transactions to be carried out under the newly enacted Article 6 mechanisms will put the ITMO's fragility from a private law perspective to the test in practice. The implementation of Türkiye's emissions trading system and other national systems currently being established in line with the Union's standards will, in turn, reveal whether these practices will lead to the functional definition and restricted property rights model becoming a more widespread model.

6.6. Concluding Remarks

The carbon market was established on a legal basis that has never been fully finalised and is subject to cross-border operations. Emissions allowances are bought, sold, traded, taxed, refunded and linked across different jurisdictions. At the same time, derivative products are being created based on these allowances, they are held in registries, and courts and judicial bodies are now being called upon to rule on the instruments governing these allowances. Yet the most fundamental question underlying this complex structure has been left for each national system to answer in its own way—or not at all. This thesis argues that the resulting fragmentation is neither accidental nor irreparable. This situation stems from a deliberate choice to leave the question of the instrument's property status to national law; it can be resolved by providing, at the level of private law, a coherent and functional classification that lower-level

⁴⁴¹ UNIDROIT Working Group on the Legal Nature of Verified Carbon Credits, Secretariat's Report (UNIDROIT 2025 - LXXXVI - W.G.7 - Doc. 2 rev.) (eighth session scheduled 15-17 April 2026; adoption anticipated 2026).

⁴⁴² UNIDROIT Working Group on the Legal Nature of Verified Carbon Credits (n 441), draft Principle 8.

regimes—such as regulation, taxation and international coordination—cannot deliver, provided that the political will is demonstrated. This instrument, which determines the carbon price, ultimately deserves to be accorded a definitive legal status. The tools to ensure this are now available; all that remains is the will to utilise them.

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