CARBON CREDITS AS ASSETS: REFORMING INDIA'S INSOLVENCY LAWS FOR CLIMATE RESILIENCE

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ABSTRACT

Carbon credits play a significant role in regulatory emissions control as well as private climate markets, functioning as tradable instruments with growing economic value. As India advances its domestic carbon market through the Carbon Credit Trading Scheme, carbon credits are increasingly held, transferred and monetised by companies. Their treatment under insolvency law, however, remains uncertain. This is because such instruments exist as registry-based intangible units rather than as conventional assets.

This paper examines the legal character of carbon credits in insolvency and identifies vulnerabilities and challenges that arise from insolvency, including issues of classification, custody, and control. It draws on doctrinal and comparative analysis of the European Union, the United Kingdom, the United States of America, and international bodies to demonstrate that the existing insolvency framework in India is ill-equipped to address registry-dependent climate instruments.

The paper argues that unresolved insolvency treatment undermines market confidence and climate investment. It proposes targeted reforms to India's insolvency regime to clarify asset classification, protect client-held credits, recognise registry-based control, and ensure continuity of carbon market infrastructure, aligning insolvency law with the operational realities of carbon markets.

Key Words: *Carbon Credits, Registry-based Assets, Custody and Proprietary Risk, Classification in Insolvency, Insolvency and Bankruptcy Code, 2016*

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I. INTRODUCTION

Climate change is one of the most significant global challenges of the twenty-first century, prompting countries to adopt market-based mechanisms to reduce greenhouse gas ('GHG') emissions. Carbon markets have become central to this effort because they allow the creation and trading of carbon credits, which represent verified reductions or removals of one metric tonne of carbon dioxide equivalent.[1] In India, the introduction of the Carbon Credit Trading Scheme ('CCTS') forms part of a broader national initiative to build a domestic carbon market that supports the country's climate commitments under the Paris Agreement.[2] These commitments include achieving net-zero emissions by 2070 and reducing the emissions intensity of Gross Domestic Product ('GDP') by 45 percent by 2030.[3] As carbon markets expand, carbon credits now carry measurable economic value and are increasingly used in commercial transactions.

Despite this increasing economic relevance, the legal position of carbon credits in insolvency remains uncertain. The Insolvency and Bankruptcy Code of 2016 ('IBC') adopts a broad and inclusive definition of property, extending to

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[1] *United Nations Carbon Offset Platform*, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, https://unfccc.int/climate-action/united-nations-carbon-offset-platform [https://perma.cc/692R-RQFH] (last visited Sept. 28, 2025).

[2] Paris Agreement, Dec. 12, 2015, T.I.A.S. No. 16-1104, 3156 U.N.T.S. 79.

[3] *Cabinet Approves India's Updated Nationally Determined Contribution to Be Communicated to the United Nations Framework Convention on Climate Change*, MINISTRY OF ENV'T, FOREST AND CLIMATE CHANGE (Aug. 3, 2022), https://www.pib.gov.in/PressReleasePage.aspx?PRID=1847813 [https://perma.cc/4UGT-C8ZV].

intangible and contingent interests. However, it does not expressly address carbon credits. This omission is significant because carbon credits are sui generis instruments whose legal existence is constituted entirely through registry entries, rather than through traditional notions of physical possession or tangible control. Unlike conventional assets, where a ledger merely records a pre-existing proprietary title, a carbon credit exists as an intangible entitlement embedded in the registry record itself.

This conceptual gap within the IBC gives rise to substantial legal and commercial risks for market participants, including holders, buyers, project developers, and intermediaries. In the event that an entity involved in the generation, holding, or management of carbon credits enters insolvency proceedings, it remains unclear whether such credits form part of the insolvency estate or whether third parties can assert proprietary or exclusionary interests over them. The consequences of this uncertainty extend beyond insolvency law. The ambiguous proprietary status of carbon credits complicates their use as collateral, thereby limiting their integration into project finance structures and established risk-allocation mechanisms.

Moreover, in the absence of a clear legal framework governing the creation and enforcement of security interests over registry-based assets, creditors may be unable to effectively realize their claims. This, in turn, discourages debt financing and constrains participation in secondary carbon markets. Over time, such legal uncertainty risks undermining confidence in carbon trading mechanisms and weakening the investment incentives necessary for the long-term viability of emission reduction projects.

This paper addresses three key research questions. First, how should carbon credits be classified for the purposes of insolvency law: as property, as contractual rights, registry-based digital assets, or do they constitute a sui generis asset category. Second, what legal safeguards are necessary to protect credit holders if a custodian, registry administrator, or project developer becomes insolvent. Third, how should claims arising from carbon credit transactions be ranked within the distribution waterfall under the IBC.

To answer these questions, the study uses a doctrinal approach to analyse relevant Indian statutes and judicial precedents. It also incorporates a comparative analysis of approaches taken in the European Union ('EU'), the United Kingdom ('UK'), and the United States ('USA'), along with guidance from international bodies on digital asset governance. Finally, it applies a policy-based normative lens to propose reforms that can strengthen legal certainty and market stability.

The remainder of this paper is organized as follows. Section II explains the legal character of carbon credits and examines the interface between carbon markets and insolvency, identifying specific gaps and vulnerabilities. Section III analyses comparative approaches and international principles. Section IV evaluates gaps within Indian law. Section V proposes reforms to clarify the legal status, protect credit holders, and introduce an appropriate mechanism within the IBC.

II. UNDERSTANDING INSOLVENCY-CARBON INTERFACE: LEGAL NATURE AND UNCERTAINTIES

Carbon credits represent verified reductions or removals of GHGs equivalent to one metric tonne of CO2. Their role in global and national climate strategies arise from their ability to convert emission reductions into tradable certificates, allowing entities to either meet regulatory requirements or voluntarily offset their emissions.4

In India, carbon credit obligations are imposed through domestic law. The Energy Conservation (Amendment) Act authorizes the Central Government to notify a Carbon Credit Trading Scheme and to issue tradable carbon credit certificates. 5 Under this framework, certain energy-intensive industries are designated as "obligated entities" and are required to meet prescribed greenhouse gas emission or energy-efficiency targets. Entities that fail to meet these targets must purchase carbon credits, while those that exceed them may generate and trade surplus credits.

This regime builds on earlier regulatory mechanisms such as the Perform, Achieve, and Trade scheme and is being expanded into a broader national carbon market. The Carbon Credit Trading Scheme is intended to play a central role in India's climate strategy, particularly its commitment to reduce emissions intensity by 45 percent by 2030 and to achieve net-zero emissions by 2070. Over time, the scope of obligated sectors and compliance requirements is expected to widen, with mandatory trading projected to commence from 2026.6

Carbon credits operate within two broad market structures: compliance markets and voluntary markets, each characterised by distinct issuance processes, regulatory designs, and legal implications.

Compliance carbon markets operate through legally binding cap-and-trade regimes established by statute or regulation. Prominent examples include the EU Emissions Trading System (EU ETS), China's national emissions trading programme, the Regional Greenhouse Gas Initiative in the United States, and emerging national frameworks such as India's carbon market. 7 Under these regimes, the government sets an overall cap on permissible greenhouse gas emissions and issues a limited number of emission allowances, each representing

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[4] *Understanding Carbon Credits and Their Role in Climate Action*, CLIMATESEED (Oct. 4, 2024, at 17:58 CET), https://climateseed.com/blog/understanding-carbon-credits [https://perma.cc/HT9D-BFTT].

[5] Energy Conservation (Amendment) Act, 2022, § 14(w), 14AA (India).

[6] *Business Brief: India's Carbon Credit Trading System Scheme (CCTS)*, INT'L EMISSIONS TRADING ASS'N (July 2025), https://www.ieta.org/uploads/wp-content/Resources/Busines-briefs/2025/IETA_Business_Brief-India_July_final-one.pdf [https://perma.cc/7BTN-ZDHJ].

[7] *See* Shuai Guo, *When Environment Meets Bankruptcy: Global Lessons for and from China*, 34 REV. EUR. CMTY. & INT'L ENV'T L. 124 (2025).

the right to emit one tonne of carbon dioxide equivalent. Entities operating in covered sectors, such as airlines, power producers, or industrial manufacturers, are legally required to monitor and report their emissions. At the end of each compliance period, they must surrender a corresponding number of allowances from their registry accounts to match their verified emissions. Failure to surrender sufficient allowances results in statutory penalties.

In practice, this means that allowances function as a mandatory compliance instrument rather than a voluntary climate measure.[8] For instance, the Lufthansa Group, whose intra-European flights fall within the scope of the EU ETS, is required to purchase and surrender EU allowances annually to cover its verified flight emissions. The cost of acquiring these allowances is treated as a routine regulatory expense, similar to a tax or licensing fee, and not as an optional sustainability initiative.9

Voluntary carbon markets operate differently. They involve credits issued by independent standards, such as Verra or Gold Standard, based on certified emission reduction projects.10 Companies and individuals acquire these credits to offset emissions on a voluntary basis, often as part of broader environmental or corporate governance commitments.11 These credits are not used to meet statutory caps, and their legal character depends primarily on the rules of the particular standard and the contractual arrangements between parties.

Companies acquire voluntary credits for strategic and reputational reasons rather than legal compulsion. These credits allow firms to address residual emissions that cannot be eliminated through internal abatement, to support projects aligned with corporate sustainability goals, and to demonstrate climate commitments to investors, customers, and regulators. In practice, voluntary markets enable firms to act in advance of regulatory requirements and to develop internal carbon management capabilities.12 For example, Microsoft purchases and retires voluntary carbon removal and reforestation credits to offset emissions that

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[8] INT'L ORG. OF SEC. COMM'N, COMPLIANCE CARBON MARKETS: FINAL REPORT (2023), https://www.iosco.org/library/pubdocs/pdf/IOSCOPD740.pdf [https://perma.cc/R8GT-YLQG]

[9] *Climate Protection*, LUFTHANSA GROUP https://report.lufthansagroup.com/2023/annual-report/en/combined-management-report/combined-non-financial-declaration/environmental-concerns/climate-protection/ [https://perma.cc/8R4P-RFES] (last visited Dec. 30, 2025).

[10] *Post 2020 Voluntary Carbon Market Principles*, GOLD STANDARD (July 4, 2023), https://www.goldstandard.org/blog-item/post-2020-voluntary-carbon-market-principles [https://perma.cc/96KX-EQFP].

[11] Charlotte Streck, *How Voluntary Carbon Markets Can Drive Climate Ambition*, 39 J. ENERGY & NAT. RES. L. 367 (2021).

[12] *Compliance vs Voluntary Carbon Markets: What's the Difference*, CARBONUNITS (Feb. 11, 2025, at 15:40 PT), https://carbonunits.com/news/compliance-vs-voluntary-carbon-markets-whats-the-difference [https://perma.cc/X22W-YXNL].

remain after internal reduction efforts, treating voluntary credit acquisition as part of its long-term net-zero strategy rather than as a compliance obligation.[13]

Regardless of market type, carbon credits share important technical traits. They are dematerialized instruments with no physical certificate evidencing ownership.14 Instead, credits exist solely as entries in electronic registries, which record issuance, transfer, and retirement. Each credit is assigned a unique serial identifier that reflects details such as project type, geography, and vintage, which refers to the year in which the underlying emission reduction or carbon removal was achieved. This information allows market participants and regulators to track the origin, age, and validity of each credit, and to ensure that the same emission reduction is not counted or traded more than once.15 The registry functions as the central ledger that establishes ownership at any point in time. Transfer occurs when the registry debits one account and credits another. A credit is only considered "used" when it is retired, meaning it is moved to a designated retirement ledger where it cannot be traded further.

The lifecycle of a carbon credit therefore typically proceeds through issuance, trading, and retirement.16 Credits are issued after a project undergoes auditing and verification by an independent third-party auditor accredited under the relevant carbon standard. For standards such as the Gold Standard, projects must undergo validation and periodic verification by approved Validation and Verification Bodies ('VVBs'), which assess whether the project meets methodological requirements and has achieved the claimed emissions outcomes.17

Only after successful verification does the registry issue carbon credits, which are then recorded as tradable units within the electronic registry. Once issued, credits may be transferred multiple times between market participants. When a purchaser seeks to apply a credit toward an emissions claim, the credit is retired, and the registry permanently records this retirement to prevent reuse. Notably, credits may also be sold *ex-ante*, before issuance, based on expectations

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[13] Aiden Green, *Microsoft's Bet on Forests: How a 3M Carbon Credit Deal Shapes Its Climate Strategy*, CARBONCREDITS.COM (May 9, 2025), https://carboncredits.com/microsoft-secures-3-million-carbon-removal-credits-for-sustainability/ [https://perma.cc/D58L-22S7].

[14] *See* LINN TAKEUCHI WALDEGREN, CARBON CREDITS: ORIGINS, EFFECTIVENESS & FUTURE (Lund Univ. Dep't of Env't and Energy Sys. Stud., 2012).

[15] *Serial Number Guide*, CLIMATE ACTION RSRV., https://climateactionreserve.org/how/program-resources/serial-number-guide [https://perma.cc/PSA2-CWLW] (last visited Dec. 13, 2025).

[16] Trey Sides, *The Carbon Credit Lifecycle Explained*, CARBON DIRECT (June 28, 2024), https://www.carbon-direct.com/insights/the-carbon-credit-lifecycle-explained [https://perma.cc/Z5WM-9FTC].

[17] Gold Standard for the Global Goals, *Validation & Verification Bodies*, GOLD STANDARD, https://globalgoals.goldstandard.org/verification-validation-bodies/ [https://perma.cc/BT7D-EV4L] (last visited Dec. 11, 2025).

of future emissions reductions.[18] Such forward sales do not constitute actual credits within the registry but merely contractual claims to future issuance.

Legally, this structure makes carbon credits intangible rights embedded in registry records. Unlike financial securities held in regulated depositaries, many carbon registries operate without detailed statutory oversight, especially in the voluntary market.19 Registry entries thus provide evidence of transfers, but legal enforceability may depend on the registry's rules and the governing law of the credit contract. Some jurisdictions have chosen to explicitly define carbon credits as property. For example, Australia treats its compliance credits as personal property, and in the USA, voluntary credits are generally regarded as tradable intangible commodities.20 In the EU and UK, emission allowances are treated as financial instruments for purposes of compliance markets, though voluntary credits remain in a more ambiguous legal zone.21 In practice, carbon credits function similarly to intangible movable property as they are transferable, identifiable, and capable of commercial circulation exclusively in digital form.

However, recognition of carbon credits as property or intangible rights in non-insolvency contexts does not, by itself, determine their treatment upon insolvency. Insolvency law serves a distinct function by defining the composition of the insolvency estate and governing priorities, security interests, and distribution. In the absence of express insolvency-specific classification, carbon credits must be accommodated within pre-existing asset categories, creating uncertainty as to whether they form part of the insolvency estate, can be subjected to security interests, or attract priority in distribution.[22] This uncertainty is particularly pronounced in jurisdictions such as India, where the development of carbon markets has not been accompanied by corresponding clarification under the

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[18] Team UNDO, *Understanding the Carbon Credit Landscape: Ex-Post, Ex-Ante and Pre-Purchases*, UNDO (Oct. 16, 2024), https://un-do.com/resources/blog/understanding-the-carbon-credit-landscape-ex-post-ex-ante-and-pre-purchases/ [https://perma.cc/WF9R-U7H8].

[19] INT'L SWAPS AND DERIVATIVES ASS'N, VOLUNTARY CARBON MARKETS: ANALYSIS OF REGULATORY OVERSIGHT IN THE U.S. (2022), https://www.isda.org/a/93WgE/Voluntary-Carbon-Markets-Analysis-of-Regulatory-Oversight-in-the-US.pdf [https://perma.cc/AK85-74QL].

[20] *See* Ben McQuhae & Co & Hong Kong Green Finance Association, *The Legal Nature of Carbon Credits*, BEN MCQUHAE & CO (March 15, 2023), https://bmcquhae.com/2023/03/15/the-legal-nature-of-carbon-credits/ [https://perma.cc/XW7H-TVCY].

[21] International Organization of Securities Commissions, *supra* note 8.

[22] Ruth Dagan, Dana Gilon, Lily Ginsberg-Keig & Isobel Sizer, *De-Risking Carbon Markets: Managing Legal Uncertainty in the Treatment of Carbon Credits*, HERZOG LAW & BEZERO CARBON (Apr. 28, 2025), https://herzoglaw.co.il/wp-content/uploads/2025/06/BeZero-x-Herzog-De-risking-carbon-markets_-Managing-legal-uncertainty-in-the-treatment-of-carbon-credits.pdf [https://perma.cc/3YBL-Q5KH].

IBC.

A. How Carbon Credits Behave Inside Insolvency Proceedings

When a company enters insolvency, its assets ordinarily vest in the insolvency estate for distribution to creditors or for use in a resolution plan. In systems such as in the USA, emission allowances and similar instruments have consistently been treated as assets of the debtor's estate and may be sold in bankruptcy proceedings.23

Under the IBC, both resolution and liquidation rely on the statutory definition of "property" which encompasses all assets, including intangible property and actionable claims.24 This broad definition supports the conclusion that carbon credits, once issued into a company's registry account, qualify as property of the debtor. During the corporate insolvency resolution process ('CIRP'), such credits would be protected by the moratorium but retained for value maximization, and in liquidation they would ordinarily fall into the liquidation estate for sale or assignment.25

However, a critical distinction exists between pre-issuance and post-issuance credits. Pre-issuance units, often called ex-ante credits, represent only contractual expectations of future reductions and do not exist as registry entries.26 As such, a debtor holding rights of future credits may possess only an unvested claim, which might not constitute property capable of inclusion in the estate. These anticipated units could be treated as contingent contractual rights, with uncertain or no market value during insolvency.27

In contrast, post-issuance credits are concrete registry assets. A debtor whose account contains issued credits holds identifiable rights capable of valuation, transfer, and liquidation, and such credits would ordinarily fall within

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[23] *See* Tilda Cho, *Treatment of Emission Reduction Credits in Bankruptcy*, 1997 U. CHI. LEGAL F. 421 (1997).

[24] "Property" includes money, goods, actionable claims, land and every description of property situated in India or outside India and every description of interest including present or future or vested or contingent interest arising out of, or incidental to, property. *See* Insolvency and Bankruptcy Code, 2016, No. 31 of 2016, § 3(27) (India).

[25] Sannidhi Chakrala & Reyyi Sameera, *Carbon Credit × Insolvency: Connecting the Future with the Present*, CBFL BLOG, NLU DELHI (Feb. 29, 2024), https://www.cbflnludelhi.in/post/carbon-credit-x-insolvency-connecting-the-future-with-the-present [https://perma.cc/3JZ9-VMF3].

[26] Team UNDO, *supra* note 18.

[27] *See* Harriet Hunnable, Braeden Mayer, Alexia Kelly, Julia Strong, & Pedro Barata, *Cambridge Permanence and Durability Voluntary Carbon Market Workshop: Resources and Summary*, Cambridge Open Engage (2024), https://www.cambridge.org/engage/coe/article-details/66c38d1ff3f4b052905d4317 [doi:10.33774/coe-2024-lq0q7].

the insolvency estate. However, the practical enforceability of a liquidator's rights may be shaped by registry rules governing account control during insolvency. For example, Article 30(5) of Commission Delegated Regulation (EU) 2019/1122 permits the temporary suspension of account access upon the opening of insolvency proceedings, pending confirmation or replacement of authorized representatives.28 While such measures do not extinguish ownership or prevent ultimate transfer, they may delay the exercise of proprietary rights. Importantly, because these restrictions operate as procedural controls rather than as divestments triggered by insolvency, they are more plausibly characterized as compatible with the UK anti-deprivation principle, which prohibits the removal of property from the estate but does not preclude temporary regulatory suspensions of control.29 The distinction thus lies not in whether post-issuance credits form part of the insolvency estate, but in how and when control over those assets may be exercised during insolvency, subject to regulatory constraints.

B. Risks That Affect Carbon Credits Across the Value Chain

Carbon credits move through a multi-stage value chain involving project developers, intermediaries or custodians, registry administrators, end buyers or traders, and insolvency at any point in this chain can disrupt ownership, transferability, and enforceability of credit rights.

Project developers generate credits by creating, verifying, and registering emission reduction projects. If a developer becomes insolvent mid-project, future credit issuance may be disrupted or fail to occur. While any credits already issued and recorded in the developer's registry account may form part of the insolvency estate and be realized, incomplete projects do not give rise to vested proprietary interests in future credits. Parties that have contracted for the delivery of unissued credits therefore hold only contractual claims, rather than rights in identifiable assets.

Ex ante transactions expose purchasers to heightened insolvency risk, as forward-purchase arrangements are typically treated as executory contracts and do not benefit from asset segregation or proprietary protection. 30 This risk is compounded by the possibility of credit invalidation due to project underperformance, natural disasters, or reversals in stored carbon, which may further reduce the availability and reliability of credits where a developer enters insolvency.[31] The 2023 Brazilian agroforestry project is a salient illustration, in

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[28] Commission Delegated Regulation 2019/1122, supplementing Directive 2003/87/EC of the European Parliament and of the Council as regards the functioning of the Union Registry, art. 30(5), 2019 O.J. (L 177) 3.

[29] Belmont Park Invs. PTY Ltd. v. BNY Corp. Tr. Servs. Ltd. [2011] UKSC 38, [2012] 1 A.C. 383 (appeal taken from Eng.).

[30] Dagan, Gilon, Ginsberg-Keig, and Sizer, *supra* note 22.

[31] Chris Slater, *Count Your Carbon Credit Risks*, CARBON INSURANCE (Apr. 27, 2023),

which prolonged drought triggered a reversal of more than 17,000 tCO_2e. The resulting losses exceeded the project's buffer reserve, placing it in deficit and rendering subsequent credit retirements effectively worthless.[32] This example demonstrates how insolvency can magnify physical reversal risks and undermine confidence not merely in prospective credit delivery, but also in credits already issued and circulating in the market.

In many carbon markets, intermediaries such as brokers, aggregators, or consultancies may hold carbon credits in a single registry account on behalf of multiple clients. 33 While these intermediaries may contractually represent individual owners, most registries do not currently offer a mechanism to record beneficial ownership distinct from the registered account holder. Registries focus on unique identifiers for each credit and on tracking issuance, transfer, and retirement, but they generally do not maintain sub-accounts or tagged ownership interests that reflect client-level beneficial entitlement within a pooled account.34

Under general common law principles, a custodian can hold assets on trust for the beneficial owner, and draft UNIDRIOT Principles on the Legal Nature of Verified Carbon Credits envisage custodial arrangements being recognized as trust relationships under domestic law.35 However, in the absence of explicit registry support for segregated holdings or statutory frameworks governing omnibus accounts, registry records will typically treat the intermediary as the legal owner of the credits for purposes of title and transfer. This structural risk was underscored in the UK in 2013, when the Insolvency Service wound up nineteen carbon credit firms after nearly £24 million had been raised from retail investors through the sale of credits that were either worthless or did not exist, leaving investors without any proprietary claim upon insolvency.[36] Where credits are pooled without a clear

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https://carboninsurance.co/count-your-carbon-credit-risks/ [https://perma.cc/6Z6G-42LM].

[32] *Biomass Case Study: Identifying Carbon Credit Failure*, SYLVERA (Dec. 17, 2025), https://www.sylvera.com/blog/biomass-case-study-identifying-carbon-credit-failure [https://perma.cc/9FYR-2WBQ].

[33] *Carbon Market Principles*, JPMORGAN CHASE & CO., https://www.jpmorganchase.com/content/dam/jpmc/jpmorgan-chase-and-co/documents/carbon-market-principles.pdf [https://perma.cc/XEW7-AVM4] (last visited Dec. 10, 2025).

[34] Sim Ting, Adrian Ang, & Tay Yong Seng, *The Legal Character of Voluntary Carbon Credits: A Way Forward*, GENZERO & ALLEN & GLEDHILL LLP (Mar. 2024), https://genzero.co/wp-content/uploads/2024/03/The-Legal-Character-of-Voluntary-Carbon-Credits-report.pdf [https://perma.cc/G643-VT3G].

[35] UNIDROIT, Draft Principles on the Legal Nature of Verified Carbon Credits, Study LXXXVI – W.G.5 – Doc. 2 rev. (2025), cmts. 11.1, 14.1, princs. 5(2), 15(2).

[36] Press Association, *Carbon Credit Fraud Firms Closed*, THE GUARDIAN (Nov. 6, 2013), https://www.theguardian.com/uk-news/2013/nov/06/carbon-credit-fraud-firms-closed [https://perma.cc/492U-GCBN].

record of beneficial interests, the intermediary's insolvency can therefore generate uncertainty as to whether the credits form part of the intermediary's estate or are held on trust for clients. Such uncertainty may impede the realisation of credits in insolvency and, in practice, relegate clients to unsecured claims, particularly where registry entries do not reliably evidence a direct transfer of ownership to the ultimate buyer.[37]

Additionally, registries are critical infrastructure for carbon markets. They ensure the uniqueness of credits, record ownership transfers, and process retirements. Because credits exist only as registry entries, failure of the registry operator poses severe legal and operational risks. Registries have experienced security incidents, including cyberattacks and account breaches in major systems.38 The temporary shutdown of all EU ETS registries following cyber thefts in January 2011, which halted transfers across the market for several months, illustrates how disruption of registry operations can immediately suspend participants' ability to transfer or retire allowances.39 During this period, accounts were frozen and registry transactions were suspended, creating uncertainty over the title of allowances that had been stolen and resold to innocent third parties even though the allowances continued to exist in economic terms.

Similar concerns arise where a registry operator becomes insolvent or is compelled to suspend operations: accounts may be frozen and market participants may be unable to transfer or retire credits pending system recovery. Restoring functionality may require migration of registry data to an alternative platform which raises ecomplex questions of legal continuity, title validity, and recognition of historical transactions. Given that registry entries are constitutive of ownership, any interruption in registry operations can directly jeopardise the enforceability and reliability of carbon credit rights.

Further, buyers, traders, or investment vehicles that hold carbon credits may also face insolvency. In such cases, unretired credits in their registry accounts become part of the insolvency estate. Creditors may claim these as valuable assets and the credits may be sold to settle debts. Problems arise when buyers have already committed credits in forward sales or have received payments for credits they have not yet delivered. Counterparties relying on such deliveries may find themselves unsecured if credits are not segregated or if contractual rights cannot

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[37] INT'L INST. FOR THE UNIFICATION OF PRIV. LAW, *Study LXXXVI – W.G.2 – Doc. 2 Rev. – Issues Paper* (Apr. 2024), https://www.unidroit.org/wp-content/uploads/2024/04/Study-LXXXVI-W.G.2-Doc.-2-Revised-Issues-Paper.pdf [https://perma.cc/FYN8-BWHQ].

[38] Slater, *supra* note 31.

[39] Clifford Chance LLP, *Changing Times: Trading Carbon in Phase 3 and the Fallout from Cyber Thefts* (Aug. 2011), https://www.cliffordchance.com/content/dam/cliffordchance/briefings/2011/08/changing-times-trading-carbon-in-phase-3-and-the-fallout-from-cyber-thefts.pdf [https://perma.cc/MB9K-84GW].

be perfected against the estate.

C. Consequences for Markets

The accumulation of risks across the carbon value chain has significant implications for the stability and credibility of carbon markets. ***Firstly***, carbon credits derive their value from verified emission reductions or removals and remain valid only so long as the underlying project continues to satisfy the requirements of the applicable standard. Credits may be rendered unusable where post-issuance verification reveals that a project failed to achieve the claimed emissions outcomes, relied on flawed methodologies, involved misreporting or fraud, or where environmental reversals such as fire or deforestation negate the underlying sequestration.40 In such circumstances, registries or standard-setting bodies may suspend, cancel, or withdraw the affected units which prevents their transfer or use for emissions claims.

These risks are distinct from ordinary commercial misjudgement by buyers. Purchasers of unissued credits are aware that contractual expectations mature into proprietary interests only upon issuance and registration. However, insolvency or project failure may prevent that transition from ever occurring, leaving buyers with contractual claims that never crystallise into registry-recognised property. The concern is therefore not the protection of poor bargains, but the structural fragility of a market in which proprietary rights are constituted through registry recognition and can be disrupted by events occurring between contract formation and issuance. This uncertainty undermines confidence in the reliability of carbon credits for emissions accounting.

Secondly, insolvency proceedings commonly involve freezing assets to facilitate collective and value-maximizing solutions. 41 When a company's registry account is frozen, credits cannot be transferred or retired. For entities relying on credits to meet compliance deadlines or voluntary commitments, such freezes can have direct operational consequences. While parties may attempt to account for this risk ex ante through contractual allocation of insolvency risk, access to registry-based credits ultimately remains contingent on the registry's own recognition of the insolvency professional. As a result, credits may remain temporarily inaccessible notwithstanding private arrangements between the parties.42 Transfers may be delayed until the resolution professional or liquidator is formally recognised by the registry, which may itself apply discretionary rules governing account access during default or insolvency. Accordingly, even where insolvency risk has been anticipated at the contracting stage, the temporary inaccessibility of credits during the moratorium period may still arise from the

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[40] *Id.*

[41] INT'L MONETARY FUND, LEGAL DEP'T , *Orderly & Effective Insolvency Procedures: Key Issues* (1999), https://www.imf.org/external/pubs/ft/orderly/ [https://perma.cc/LS3S-V6AS].

[42] DAGAN ET AL., *supra* note 22.

operational design of registry-based markets.

Thirdly, participants who have prepaid for credits, entered forward purchase agreements, or financed project development may find themselves unsecured if the counterparty becomes insolvent. Carbon credits, particularly pre-issuance units, often lack characteristics of secured collateral.[43] Without legal segregation or trust-like protections, parties may be left with general unsecured claims, which typically receive low recovery in liquidation. Since carbon credits are intangible and governed by private registry rules, insolvency courts may not give priority to claimants whose expectations were based on voluntary standards rather than statutory entitlements.[44]

Lastly, uncertainty about credit treatment in insolvency can deter investment in carbon projects.[45] Investors may hesitate to commit capital to long-duration projects if they fear credits could be tapped in bankruptcy or invalidated.[46] Recent market data suggests that although retirements remain relatively steady, overall trading volumes have declined, reflecting increased caution.[47] Buyers appear to prioritise high-quality credits and rely more heavily on long-term offtake agreements, including those involving pre-issuance commitments, indicating a

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[43] ISABELLA MUELLER ET AL., CARBON TRANSITION RISK AND CORPORATE LOAN SECURITIZATION 63 (J. FIN. INTERMEDIATION, 101146 2025).

[44] UNITED NATIONS COMM'N ON INT'L TRADE L., *UNCITRAL/UNIDROIT Study on the Legal Nature of Verified Carbon Credits Issued by Independent Carbon Standard Setters*, U.N. Doc. A/CN.9/1191 , ¶ 38 (Mar. 14, 2024)). See also, BMC QUHAE, *The Legal Nature of Carbon Credits* (Mar. 15, 2023), https://bmcquhae.com/2023/03/15/the-legal-nature-of-carbon-credits/ [https://perma.cc/GW98-Z2HH].

[45] See Leonhard Meitner, *Voluntary Carbon Markets: A Critical Assessment*, Working Paper No. 246/2024, INST. FOR INT'L POLITICAL ECON., Berlin School of Economics and Law (2024), https://www.econstor.eu/bitstream/10419/308040/1/1912779870.pdf [https://perma.cc/2BTK-FKJW].

[46] Harriet Hunnable, Braeden Mayer, Alexia Kelly, Julia Strong & Pedro Barata, *Cambridge Permanence and Durability Voluntary Carbon Market Workshop: Resources and Summary* (2024), https://doi.org/10.33774/coe-2024-lq0q7 [https://perma.cc/N783-TJG6].

[47] *Quality Takes the Lead: How the Voluntary Carbon Market Evolved in 2024*, GREEN EARTH (June 5, 2025), https://www.green.earth/news/quality-takes-the-lead-how-the-voluntary-carbon-market-evolved-in-2024 [https://perma.cc/7TYH-JSND] (discussing the 2024 voluntary market data show retirements holding steady (~175 million tonnes) even as trading volumes fell about 25%. Average prices in 2024 were around US$6 per tCO_2e – slightly down 5.5% from the year before – yet still more than double those of five years ago).

desire to secure predictable supply amid market uncertainty.[48] These trends highlight that while demand for credible credits persists, the legal and insolvency risks inherent in the market influence purchasing behaviour.

To sum up, the technical design and legal character of carbon credits place them in an uneasy position within insolvency law. Their existence as dematerialized, registry-based instruments means that ownership and value are deeply dependent on private registry rules, contractual arrangements, and uninterrupted institutional functioning. While post-issuance credits increasingly resemble intangible property capable of entering the insolvency estate, pre-issuance credits remain contingent and vulnerable, offering little protection to counterparties. Insolvency across the carbon value chain, whether at the level of project developers, intermediaries, registries, or end buyers, exposes structural weaknesses that can lead to frozen assets, unsecured claims, and the effective loss of credits. These uncertainties not only complicate insolvency outcomes but also threaten confidence in carbon markets more broadly, underscoring the need for a clearer legal framework that aligns insolvency law with the realities of carbon trading.[49] The next section examines how different jurisdictions have responded to

[48] Notably, a growing share of purchases are via long-term offtake agreements: over 20 million removal credits (≈10% of all 2024 retirements) were acquired through forward contracts on pre-issuance projects. *2024 End of Year Report: VCM 2024 Review and Emerging Trends for 2025*, ALLIEDOFFSETS (2025), https://alliedoffsets.com/wp-content/uploads/2025/01/VCM-2024-Recap-Emerging-Trends-for-2025.pdf#:~:text=Over%2020m%20of%20the%20NBS,continue%20to%20grow%20in%202025 [https://perma.cc/2RCS-QXU5].

[49] Concrete instances illustrate how legal, regulatory, and insolvency-related uncertainties have disrupted carbon markets and undermined market confidence. In the United States, a climate-finance firm engaged in the origination and sale of voluntary carbon credits filed for Chapter 11 bankruptcy protection before the U.S. Bankruptcy Court for the District of Delaware (Case No. 25-10603), amid fraud allegations against its co-founder and reported liabilities of approximately USD 170 million. The insolvency proceedings materially affected the firm's ability to trade, finance, and service carbon credit transactions, highlighting how financial distress and unresolved legal claims can impair credit liquidity and counterparty confidence. In the United Kingdom, regulatory enforcement action culminated in the compulsory winding-up of 19 carbon credit sales companies following findings of misleading sales practices, with more than 1,500 investors reportedly losing approximately GBP 24 million, underscoring how weak oversight and subsequent insolvencies can leave market participants without effective recourse. Beyond firm-specific failures, investigative reporting and market analysis have documented systemic risks in voluntary carbon markets, including the issuance of so-called "ghost credits" and misrepresentation of underlying project benefits, with commentators warning that such practices erode trust in credit quality and market integrity. Policy and research

these challenges.

III. COMPARATIVE ANALYSIS: HOW OTHER JURISDICTIONS TREAT CARBON CREDITS IN INSOLVENCY

This section begins by examining the UNIDROIT Draft Principles on Digital Assets and related work on verified carbon credits, which provide a transnational framework for recognising proprietary rights, addressing custodian insolvency, and structuring asset protection for registry-based digital assets. Building on this broader international perspective, the section then turns to selected domestic jurisdictions that have developed more concrete legal approaches to carbon credits, offering how these principles are applied or adapted in practice.

A. The UNIDROIT Draft Principles on Digital Assets and Verified Carbon Credits

The UNIDROIT Draft Principles on Digital Assets and Private Law represent the most systematic international attempt to address the legal uncertainties surrounding the treatment of registry-based digital assets, including verified carbon credits ('VCC'), in private law and insolvency contexts.[50]

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bodies have similarly identified weak governance, fraud, and corruption risks in voluntary carbon markets as drivers of reputational damage and market uncertainty, calling for clearer legal standards and institutional oversight. *See* Becky Yerak, *Celebrity-Backed Bankrupt Carbon Credit Seller Arranges Financing Amid Fraud Charges Against Co-Founder*, WSJ PRO (Apr. 2, 2025), https://www.wsj.com/articles/celebrity-backed-bankrupt-carbon-credit-seller-arranges-financing-amid-fraud-charges-against-co-founder-17ca3119 [https://perma.cc/DN4B-F4C4]; *Carbon credit fraud firms closed amid claims of deception*, THE GUARDIAN (Nov. 6, 2013), https://www.theguardian.com/uk-news/2013/nov/06/carbon-credit-fraud-firms-closed [https://perma.cc/R2V2-YRX6]; Michael Szabo, *UK Watchdog Says Investors Lose 24 Million Pounds in Carbon Credit Scam*, REUTERS (Nov. 6, 2013), https://www.reuters.com/article/business/environment/uk-watchdog-says-investors-lose-24-million-pounds-in-carbon-credit-scam-idUSBRE9A50L1/ [https://perma.cc/QU9W-25SZ]; Eric Koons, *What Is Carbon Credit Fraud? How Does It Impact Climate Action?*, ENERGY TRACKER ASIA (Oct. 29, 2024), https://energytracker.asia/what-is-carbon-credit-fraud/ [https://perma.cc/5V6H-AB5L]; Dan Marks & Jennifer Scotland, *Scoping Corruption in Voluntary Carbon Markets*, GIACE (July 2025), https://giace.org/wp-content/uploads/2025/07/scoping-corruption-in-voluntary-carbon-markets-july-2025_0.pdf [https://perma.cc/DUQ8-5KW9].

[50] "'Verified carbon credit' (VCC) means a unit that represents the achievement of a reduction in, or removal of, emission into the atmosphere of GHGs equivalent to one tonne of CO2 equivalent as a result of a carbon mitigation project if

Developed against the background of growing tokenization and dematerialization of assets, the Draft Principles seek to provide a coherent framework for recognizing proprietary rights, allocating risk, and safeguarding asset holders when intermediaries or market participants become insolvent.

At the core of the UNIDROIT framework lies a ***control-based proprietary model***. Under this approach, ownership of a digital asset is determined by control rather than by traditional notions of possession or paper title.[51] Control refers to the exclusive factual and legal ability to derive benefits from the asset and to exclude others from doing so.[52] Applied to VCCs, this means that the person who holds the relevant registry rights or technical means of disposition is recognized as having a proprietary interest in the credit. This model is particularly suited to assets that exist only as registry entries, as it avoids reliance on physical indicia of possession and instead aligns legal rights with operational reality.

Importantly, the Draft Principles expressly address the effect of insolvency on proprietary rights in digital assets. They proceed on the basis that proprietary rights in a digital asset, once validly established prior to insolvency, continue to be effective against insolvency practitioners and the general body of creditors. In this sense, digital assets are treated analogously to conventional property. Principle 19 states that where an insolvent person owns a digital asset, the insolvency representative may take control of the asset for the purposes of administration or liquidation, and secured creditors may enforce their rights against it in accordance with applicable insolvency law.[53] This position reflects the broader premise that insolvency does not extinguish proprietary rights but merely reallocates them in accordance with statutory procedures.

A central concern addressed by the UNIDROIT Principles is the risk posed by ***custodian insolvency***, which is particularly acute in carbon markets where intermediaries frequently hold credits on behalf of multiple clients.[54] The Draft

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(a) The achievement of the reduction or removal is verified by a positive verification statement;
(b) The positive verification statement is [approved][accepted]
(c) The unit is credited to an account in a VCC registry; and
(d) The unit is individuated using a unique identifier." *See* Draft Principles on Digital Assets and Verified Carbon Credits, princ. 2(1), (UNIDROIT 2024) [hereinafter *Draft Principles*].

[51] *See Draft Principles*, *supra* note 50, at princ. 20.

[52] *See id.* at Comment. 3.2.

[53] *Id.* at princ. 19.

[54] "(1) 'Intermediary' means a person who provides services to another person in respect of a VCC.
(2) 'Client' means a person to whom an intermediary provides services.
(3) 'Custodian' means an intermediary who is a registered holder of a VCC and who provides services to another person pursuant to a custody agreement in respect of that VCC.
(4) 'Sub-custodian' means a custodian who provides services to another custodian pursuant to a custody agreement in respect of that VCC.

Principles adopt a strong presumption in favor of asset segregation in custody relationships. Unless an agreement expressly provides otherwise, any digital asset held by a service provider is presumed to be held on behalf of the client and not as part of the provider's own estate.[55] This presumption fundamentally shifts the burden of risk allocation. In the absence of clear contractual language to the contrary, client-held VCCs are insulated from the custodian's creditors. While this default rule protects purchasers, it also narrows the extent to which credited assets contribute to the intermediary's balance sheet, with potential implications for liquidity and valuation. The Principles therefore leave space for custodians to contractually rebut or qualify the presumption, reflecting the underlying tension between legal insulation of client assets and the commercial viability of custodial business models.

This approach is articulated in detail in Principle 17, which specifically addresses the insolvency of a custodian.[56] Principle 17(1) and (2) provide that a VCC maintained by a custodian for a client does not form part of the custodian's assets available for distribution to its creditors. This protection extends even where a sub-custodian is involved. If a custodian holds a VCC through a sub-custodian and the custodian enters insolvency proceedings, the custodian's rights against the sub-custodian with respect to that VCC are similarly excluded from the insolvency estate. The objective is to prevent client assets from being indirectly absorbed into the custodian's estate through layered custody structures.

Principle 17 further imposes affirmative duties on insolvency representatives. Upon the insolvency of a custodian, the insolvency representative must take reasonable steps to ensure that VCCs registered in the custodian's account are transferred to the client's registry account or to another custodian nominated by the client. Where rights exist against a sub-custodian, those rights must likewise be made accessible to the client. This procedural obligation is significant because it recognises that, for registry-based assets, mere legal recognition of ownership is insufficient unless accompanied by mechanisms to effect actual transfer and control.

The Principles also address the problem of shortfalls in pooled custody arrangements, where a custodian maintains VCCs of the same description for multiple clients as an undivided pool. Where the quantity held is insufficient to meet the custodian's obligations, Principle 17 introduces a waterfall mechanism under which any shortfall is first met from VCCs held for the custodian's own account, with any remaining deficit shared proportionately among clients. This allocation rule is designed to promote inter-client fairness while subordinating the custodian's proprietary interests. However, in jurisdictions such as the UK, the

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(5) A custodian 'maintains' a VCC for a client if: (a) That custodian is the registered holder of the VCC; or (b) That custodian enters into a custody agreement with a sub-custodian with respect to the VCC [in the circumstances set out in Principle 15(4)]." *See id.* at princ. 14.

[55] *See id.* at princ. 16.

[56] *Id.* at princ. 17.

absence of individual segregation would ordinarily lead courts to characterize clients' claims as purely contractual, with legal and beneficial title to the pooled VCCs remaining with the custodian.[57] Against this background, Principle 17 represents a clear departure from orthodox English private law, as it effectively mandates a pro-rata proprietary allocation in circumstances where proprietary interests would not otherwise be recognized. Its operation would therefore require a departure from, or statutory modification of, the conventional treatment of undivided custody pools under English law.

While the UNIDROIT Draft Principles articulate concrete rules to address specific insolvency scenarios, particularly in the context of custodial arrangements and asset segregation, they did not emerge in isolation. These provisions are best understood as a normative response to a set of structural risks identified in earlier international work on verified carbon credits. To assess both the scope and the limits of the UNIDROIT framework, it is therefore necessary to situate the Draft Principles against the backdrop of the UNCITRAL-UNIDROIT study, which mapped the insolvency-related vulnerabilities of VCCs across registries, projects, holders, and jurisdictions.58

The March 2024 UNCITRAL/UNIDROIT study on the legal nature of VCCs issued by independent carbon standard setters identified five key problems relating to the treatment of VCCs in insolvency. 59 The UNIDROIT Draft Principles represent an attempt to address the uncertainties highlighted in the study. While Principle 17 secures client-held VCCs against custodian insolvency, Principle 24 affirms their proprietary character against the insolvency estate, and the Issues Paper situates cross-border cases within the existing UNCITRAL framework, significant gaps remain. These are summarized in the table below.

Problem (UNCITRAL/ UNIDROIT Study)	**Response in UNIDROIT Principles / Issues Paper**	**Remaining Gap**
Registry Insolvency Risk: VCCs may cease to have legally recognizable	VCCs held for clients are ring-fenced from custodian's estate.[60]	Does not resolve the underlying ontological question of whether

[57] *See* Stephen G. Sims & Patrick Brandt, *UK's Supreme Court Issues Judgment on Lehman Brothers Client Money Litigation*, JD SUPRA (Mar. 13, 2012), https://www.jdsupra.com/legalnews/uks-supreme-court-issues-judgment-on-le-03106/#:~:text=The%20Supreme%20Court%20was%20asked,to%20it%20under%20that%20trust [https://perma.cc/7G2R-PV8E].

[58] U.N. Comm'n on Int'l Trade L., *UNCITRAL/UNIDROIT Study on the Legal Nature of Verified Carbon Credits Issued by Independent Carbon Standard Setters*, U.N. Doc. UNCITRAL/UNIDROIT/—(June 24–July 12, 2024).

[59] *Id.*

[60] The International Institute for the Unification of Private Law, *Draft UNIDROIT*

existence if the registry is treated as constitutive of the credit rather than merely evidentiary.	Proprietary rights survive insolvency.[61]	registries are constitutive of VCC existence or merely serve an evidentiary function.
Project Proponent Insolvency: If project developer goes bankrupt, the long-term permanence of the underlying carbon storage may be undermined.	Proprietary rights in already-issued VCCs remain valid against insolvency estate.[62]	Environmental integrity concerns remain, as the legal survival of a VCC does not necessarily correspond to the continued physical permanence of the underlying carbon storage.
Holder Insolvency Risk: Insolvent holder's VCCs may become inaccessible, particularly where registry transfers require the cooperation or instruction of the insolvent holder.	Proprietary rights of transferees/secured creditors remain effective against insolvency estate.[63]	Practical challenges relating to the execution of registry transfers remain unresolved, particularly where the insolvent holder fails or refuses to provide the necessary instructions.
Legal Nature Ambiguity: VCCs may be characterised as property, contractual rights, or registry-based interests, with insolvency outcomes contingent upon the applicable legal	Treats VCCs as capable of proprietary rights effective against third parties.[64]	Continues to depend on consistent classification under domestic property law.

Principles on The Legal Nature of Verified Carbon Credits, princ. 17, (Mar. 2025), https://www.unidroit.org/wp-content/uploads/2025/04/Study-LXXXVI-W.G.5-Doc.-2-rev.-Draft-Principles.pdf [https://perma.cc/DLT7-ESR6].

[61] The International Institute for the Unification of Private Law, *Draft UNIDROIT Principles on The Legal Nature of Verified Carbon Credits*, princ. 24, (Mar. 2025), https://www.unidroit.org/wp-content/uploads/2025/04/Study-LXXXVI-W.G.5-Doc.-2-rev.-Draft-Principles.pdf [https://perma.cc/HEW4-7ZGC].

[62] *Id.*

[63] *Id.*

[64] *Id.*

classification.		
Cross-Border Insolvency Uncertainty: VCCs typically involve multiple jurisdictions, including those of the registry, the project, and the holder, giving rise to conflict-of-law issues.	Suggests using UNCITRAL Model Law on Cross-Border Insolvency + Legislative Guide on Insolvency Law to harmonize treatment.[65]	Effectiveness remains contingent on state adoption and implementation, and no VCC-specific conflict-of-law rules have yet been developed.
Ranking & Avoidance Rules in Insolvency: Even where proprietary rights in VCCs are recognised, insolvency law may re-order claims or permit avoidance of prior transactions.	Acknowledges insolvency law's mandatory rules (ranking, preferences, fraudulent transfers) still apply.[66]	Leaves unresolved questions regarding the application of avoidance and priority rules to novel assets such as VCCs.

Taken together, the UNCITRAL-UNIDROIT study and the subsequent Draft Principles demonstrate significant progress is recognising VCCs as assets capable of proprietary protection and in shielding client-held credits from custodian insolvency. At the same time, they reveal persistent structural gaps relating to registry dependence, environmental permanence, cross-border coordination, and the interaction between proprietary rights and insolvency distribution rules. These unresolved issues underscore the limits of soft-law solutions and highlight the need for domestic legal systems to develop more precise statutory and procedural responses.

B. The European Union

Under EU law, emission allowances issued under the EU ETS are treated as ***tradable intangible assets***. Several Member States have given this character explicit statutory recognition. For instance, in France, EU ETS allowances are classified as intangible movable assets, a status that allows them to be transferred and subjected to security interests, albeit with legal and practical complexities

[65] The International Institute of Unification of Private Law, *Issues Paper*, at 28, Study LXXXVI – W.G.1 – Doc. 2 (Oct. 2023), https://www.unidroit.org/wp-content/uploads/2023/10/Study-LXXXVI-W.G.1-Doc.-2-Issues-Paper.pdf [https://perma.cc/2VYU-QSSB].

[66] The International Institute for the Unification of Private Law, *Draft UNIDROIT Principles on The Legal Nature of Verified Carbon Credits*, princ. 24, (Mar. 2025), https://www.unidroit.org/wp-content/uploads/2025/04/Study-LXXXVI-W.G.5-Doc.-2-rev.-Draft-Principles.pdf [https://perma.cc/SYN4-HBXW].

inherent to intangible property.[67] This classification positions allowances not as mere regulatory permissions, but as marketable assets capable of circulation within private law frameworks.[68] Judicial interpretations at the EU and Member State level reinforce this understanding. In *Armstrong v. Winnington*, applying EU law, an English court held that EU Allowances ('EUAs') constitute intangible property, confirming that allowances are neither simple permits nor debt claims, but transferable regulatory commodities.[69]

A central feature of the EU framework is the registry-based system of title. The EU Registry Regulation provides that entries in registry accounts constitute sufficient, prima facie evidence of ownership, and that a transferee acting in good faith acquires good title free from prior defects.[70] As a result, ownership disputes are resolved by reference to registry records rather than underlying contractual arrangements. In practice, EU ETS Allowances held in registry accounts function similarly to bank account credits or dematerialised securities, with legal certainty anchored in statutory registry rules.

In insolvency, EU ETS Allowances are treated as part of the ***debtor's estate*** as intangible property, subject to ordinary insolvency rules.[71] EU directives do not provide any special exclusion or carve-out for emissions allowances in insolvency proceedings. Accordingly, allowances held by an insolvent operator may be administered, transferred, or sold by the liquidator or administrator in the same manner as other intangible assets. The absence of a bespoke insolvency regime has not produced significant uncertainty, largely because the statutory registry framework provides clear rules on title and transfer.

This interaction between emissions regulation and insolvency law is illustrated in EU case law concerning insolvent operators. In *ET v. Bundesrepublik Deutschland* (Case C-165/20), arising from the insolvency of Air Berlin, the Court of Justice held that free allowances allocated to an aircraft operator must be reduced proportionately where the operator ceases aviation activities during the

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[67] Dir. 2003/87/EC of the Eur. Parl. and of the Council of Oct. 13, 2003, establishing a scheme for GHG emission allowance trading within the Cmty.and amending Council Directive 96/61/EC, O.J. (L 275), *transposed into* French law by Ord. No. 2004-330 of Apr. 15, 2004, and codified at C. env. arts. L. 229-5 to L. 229-19 (Fr.).

[68] *See* Kelvin F.K. Low & Jolene Lin, *Carbon Credits as EU Like It: Property, Immunity, TragiCO_2medy?*, 27 J. ENV'T L. 377 (2015).

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

[70] *See* Bonnie Holligan, *Commodity or Propriety? Unauthorised Transfer of Intangible Entitlements in the EU Emissions Trading System*, 83 MOD. L. REV. 979 (2020).

[71] *See* EUROPEAN COMMISSION, LEGAL NATURE OF EU ETS ALLOWANCES (2019), https://op.europa.eu/s/Ad3K. OR Eur. Comm'n, Directorate-General for Climate Action, Ecologic, Milieu Ltd, & Klimapolitika, Legal Nature of EU ETS Allowances, at 18 (2019), https://data.europa.eu/doi/10.2834/014995.

relevant trading period.[72] The decision confirms that allowance allocation and retention are closely tied to continued participation in regulated activities, even where insolvency intervenes.

Similarly, in *Bitter v. Germany* (2015), the Court of Justice considered the consequences of insolvency for an operator that failed to surrender allowances.[73] The Court upheld the validity and proportionality of the fixed statutory penalty imposed for non-surrender of allowances, notwithstanding the operator's insolvency. This reinforces the principle that insolvency does not suspend or dilute obligations under the EU ETS, and that enforcement mechanisms remain effective against insolvent entities.

To conclude, the EU approach demonstrates a high degree of legal clarity. Emission allowances are consistently treated as intangible property, ownership is determined by statutory registry records, and insolvency law applies without creating uncertainty as to title. The EU model shows that clear classification and robust registry rules can integrate carbon assets into insolvency proceedings without destabilising markets or undermining regulatory objectives.

C. The United Kingdom

In the United Kingdom, the legal treatment of emission allowances has developed primarily through judicial interpretation rather than explicit statutory classification. The legislative framework governing the UK Emissions Trading Scheme does not directly define the legal nature of UK Allowances ('UKAs'). However, English courts have addressed the legal character of EUAs, and this jurisprudence continues to shape the understanding of UKAs in the post-Brexit context.

The leading authority is *Armstrong DLW GmbH v. Winnington Networks Ltd* (2012), in which the High Court held that EUAs constitute intangible property.[74] The Court did not, however, determine whether EUAs constitute *choses in action*, that is, property rights such as debts or contractual claims enforceable only through legal action, or fall within another category of intangible property, and considered this precise classification unnecessary for resolving the dispute. Subsequent views have suggested that EUAs are better understood as "other" intangible property rather than choses in action, because they do not confer an enforceable right to emit GHGs.[75] Instead, they operate as an exemption from

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[72] Case C-165/20, ET v. Bundesrepublik Deutschland, ECLI:EU:C:2022:42, ¶ 65 (Jan. 20, 2022).

[73] Case C-580/14, Sandra Bitter v. Bundesrepublik Deutschland, ECLI:EU:C:2015:835, ¶ 2 (Dec. 17, 2015).

[74] Armstrong, [2012] EWHC (Ch) 10 [52], [58], [2013] Ch 156 [52] (Eng.).

[75] *See* Guy Usher & Steven Burrows, *Emissions Allowance Financing: Structuring, Legal and Regulatory Considerations* (Nov. 14, 2023),

the imposition of statutory penalties for emissions, drawing an analogy with regulatory quotas such as fishing or export quotas, which English courts have previously recognised as intangible property.

In insolvency, emission allowances held by a UK company are treated as ***assets of the insolvency estate***, falling within the administrator's or liquidator's powers, subject to applicable regulatory obligations. Insolvency practitioners may therefore sell or transfer allowances in the course of administration or liquidation, provided that surrender obligations under emissions regulation are addressed.

Where allowances are held through intermediaries such as brokers or custodians, English trust and company law principles assume particular importance. Proprietary protection may arise under a statutory or regulatory trust regime, as recognised in *Re Lehman Brothers International (Europe)*, where client assets were treated as held on trust from the moment of receipt, independent of subsequent segregation.[76] Outside such regimes, English courts have consistently held that payment into a client or segregated account does not, by itself, give rise to proprietary rights. In *Gore v Mishcon de Reya* and *Bellis v Challinor*, the courts held that a trust will arise only where there is clear evidence of an intention to confer protection, typically reflected in express limitations on the purposes for which the assets may be used.[77] Where such interests are validly established, insolvency practitioners are required to respect them and cannot treat client-held credits as part of the general estate. In this respect, emission allowances resemble other financial assets held through intermediaries, for which continuity of ownership may be preserved notwithstanding intermediary insolvency. Because emission allowances are recognised as property, they may also be subject to fixed or floating charges under English law.[78]

UK insolvency practice has also engaged with carbon credits in the context of fraud and market abuse. In *Bilta (UK) Ltd v. Tradition Financial Services Ltd*, carbon credits traded under the EU ETS formed part of a VAT fraud scheme that

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https://www.fieldfisher.com/en/insights/emissions-allowance-financing-structuring-legal-and-regulatory-considerations; *see also* Attorney General of Hong Kong v. Daniel Chan Nai-Keung [1987] UKPC 19 [2]–[3] (appeal taken from H.K.).

[76] *Re* Lehman Brothers International (Europe) [2012] UKSC 6 (Eng.).

[77] *Gore v. Mishcon de Reya* [2015] EWHC (Ch) 164 [18] (Eng.); *Bellis v. Challinor* [2015] EWCA (Civ) 59 [56](Eng.).

[78] Under English law a security interest such as a fixed or floating charge must be registered under Part 25 of the *Companies Act 2006*, failing to do so may render the security interest void against liquidators or other creditors. *See* Companies Act 2006, c. 46, pt. 25, §§ 859A–859H, 860, 878, 885 (UK). Once created, the **substantive characterization** of the charge as fixed or floating is a matter of common law. *See Re* Spectrum Plus Ltd. [2005] UKHL 41, [2005] 2 AC 680 (UK); Illingworth v. Houldsworth [1904] UKHL 486, [1904] AC 355 (HL) (UK). In insolvency, floating charges are subject to statutory priorities and subordination under the *Insolvency Act 1986*. Insolvency Act 1986, c. 45 (UK).

ultimately led to the companies' insolvency.[79] Although the case did not turn on the proprietary nature of allowances, it demonstrates that carbon credits are treated as commercial assets capable of giving rise to creditor claims and insolvency liability. Similarly, UK courts have ordered the liquidation of companies engaged in misleading carbon credit sales schemes, reinforcing that carbon credits are not treated as speculative investments insulated from insolvency scrutiny.[80]

Overall, the UK approach reflects a property-based treatment grounded in common law, with insolvency outcomes shaped by established doctrines of intangible property and trust law. While statutory clarity remains limited, judicial recognition of emission allowances as intangible property has allowed them to be accommodated within existing insolvency structures without significant doctrinal disruption.

D. The United States of America

In the USA, the treatment of carbon and emissions credits in insolvency has developed largely through bankruptcy practice rather than through a dedicated statutory framework. While emission credits such as those under the Regional Greenhouse Gas Initiative ('RGGI') and other cap-and-trade or renewable fuel programs have not frequently appeared in bankruptcy litigation, courts and practitioners have generally treated such credits, or at least their economic value, as property of the debtor's estate. At the same time, the regulatory regimes governing these credits can impose compliance obligations that operate as liabilities, such that emission credits may function simultaneously as assets and as regulatory burdens depending on the context and the applicable emissions framework, a feature common to emissions trading regimes.

As a general rule, carbon credits held by a debtor are treated as property of the estate under the Bankruptcy Code, reflecting the expansive scope of 11 U.S.C. § 541, which captures all legal and equitable interests of the debtor at the commencement of the case.[81] Consistent with this approach, several Chapter 11 proceedings illustrate how emission credits have been treated as part of the debtor's asset pool. In cases involving *Enron, and the Flying J truck stop chain*, bankruptcy courts approved the sale or transfer of emission reduction credits as part of the estate.[82] These cases reflect a settled assumption that emission credits,

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[79] Bilta (UK) Ltd. v. Tradition Financial Services Ltd. [2025] UKSC 18, [2026] AC 140 (UK).

[80] *See 'Callous' firms in carbon credit scam shut* down, BBC (May 22, 2014), https://www.bbc.com/news/business-27530039.

[81] *See* 11 U.S.C. § 541.

[82] *See generally In re* Enron Corp., No. 01-16034 (AJG) (Bankr. S.D.N.Y. June 20, 2003); *In re* Flying J, Inc., No. 08-13384 (Bankr. D. Del. Dec. 28, 2009).

In Enron, seeking to recharacterise a loan secured by sulphur dioxide credits as a sale,

once held by the debtor, form part of the bankruptcy estate and may be monetized to maximize value for creditors.

Recent U.S. cases have also shown that emission credits may arise in insolvency not only as assets but also as compliance obligations. For example, in the Chapter 11 proceedings of *Philadelphia Energy Solutions Holdings*, the debtors had unresolved liabilities under the Clean Air Act's Renewable Fuel Standard ("RFN") program, which requires refiners to acquire and retire renewable identification numbers ("RINs") to satisfy annual blending obligations.[83] Because the debtors had not acquired sufficient RINs to meet their RFS obligations, the United States and the debtors entered into a court–approved settlement to resolve the debtors' RFS-related liabilities and establish specific RIN retirement obligations under a consent decree, rather than through the sale or transfer of credits as estate assets. This reflects how, in insolvency, emission credits can also give rise to regulatory retirement requirements and attendant liabilities that must be addressed in the plan of reorganization or settlement process.

A more developed analysis emerged in *La Paloma Generating*.[84] There, the debtor's secured lender acquired the company's assets through a credit bid, and the bankruptcy court was asked to determine whether the purchaser assumed successor liability under California's cap-and-trade program. The Court held that neither section 363(f) of the Bankruptcy Code nor the relevant California regulations imposed successor liability for pre-transfer emissions obligations.[85] As a result, the purchaser took the assets free and clear of the debtor's prior cap-and-trade liabilities and became responsible only for regulatory obligations arising after the sale closed. The court characterized emission surrender obligations as an "interest" within the meaning of section 363(f), capable of being cleansed through a bankruptcy sale, while noting that a different outcome could follow if the regulatory framework expressly imposed successor liability.

Beyond bankruptcy jurisprudence, US courts and authorities have addressed the legal character of carbon credits in related contexts. In *Roseland Plantation, LLC, v. United States Fish and Wildlife Service*, a federal district court held that the right to report, transfer, or sell carbon credits forms part of the bundle of rights associated with property ownership, suggesting that such credits may be treated as a real property interest in certain contexts.[86]

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the company transferred $167.6 million worth of credits to an SPV (Colonnade) created by Barclays. In Flying J, the court approved a $12.1 million sale of nitrogen oxide and sulphur dioxide credits to a joint venture backed by BP and Rio Tinto.

[83] *In re* PES Admin. Serv., LLC, Case No. 19-11626 (LSS) (Bankr. D. Del. May 01, 2020).

[84] *In re* La Paloma Generating Co., No. 16-12700 (CSS), 2017 Bankr. LEXIS 3876, at *3 (Bankr. D. Del. Nov. 9, 2017).

[85] See 11 U.S.C. § 363 (2018).

[86] Roseland Plantation LLC v. United States Fish and Wildlife Serv. et al, 2006 U.S. Dist. LEXIS 29334, at *9–10 (W. D. La. 2006).

This characterization is reinforced in tax law. In a *private letter ruling*, the Internal Revenue Service concluded that carbon emission allowances traded on the European Climate Exchange constituted intangible property used in a trade or business and indicated that similar credits under US cap-and-trade regimes would likely receive comparable treatment.[87] Courts have also recognized claims to emission reduction credits based on operational control over emitting activities, as seen in *Kaiser International Corporation v. Hearing Board of the South Coast Air Quality Management District*, where a claimant's possessory interest in leased equipment was sufficient to support a claim to the emission credits generated through its operation.[88]

To conclude, the US approach reflects a strong estate-centric logic. Emission credits are generally treated as intangible property forming part of the bankruptcy estate and may be sold free and clear of associated regulatory interests, unless the governing regulatory framework explicitly provides otherwise. At the same time, compliance obligations linked to emissions regimes can survive insolvency and continues to inform the allocation of risk among debtors, purchasers, and regulators. This approach has allowed US bankruptcy law to accommodate carbon credits without recognizing them as a distinct or protected asset class.

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The comparative analysis reveals a shared trend toward recognizing carbon credits as transferable intangible assets, while adopting markedly different strategies for addressing insolvency risk. The UNIDROIT framework prioritizes proprietary recognition and client-asset segregation to insulate credits from an intermediary's failure, whereas the EU and the UK rely on clear property classification supported by robust registry requirements and trust-based mechanisms. In contrast, the USA adopts an estate-centric approach, treating emission credits primarily as assets or liabilities within bankruptcy proceedings, subject to regulatory constraints. Together, these approaches demonstrate that while legal recognition of carbon credits as assets is largely settled, the extent to which insolvency law protects credit holders varies significantly and underscores the need for jurisdiction-specific reform in India.

IV. THE INDIAN POSITION: GAPS AND SYSTEMATIC WEAKNESSES

This section examines the position of carbon credits within the Indian legal framework, focusing on the interaction between insolvency law and the emerging domestic carbon market. It identifies statutory gaps under the IBC and carbon market regulations, analyzes how Indian courts have approached carbon credits in

[87] I.R.S. Priv. Ltr. Rul. 200825009 (June 20, 2008).

[88] Kaiser Int'l Corp. v. Hearing Board of the South Coast Air Quality Mgmt. Dist., 2006 Cal. Unpub. LEXIS 3135, at *20–21 (Cal. Ct. App. Apr. 17, 2006).

related contexts, and highlights the broader systemic consequences of these apertures for market stability and India's climate commitments.

A. Statutory Gaps in the IBC and Carbon Market Regulations

A central weakness in the Indian legal framework lies in the absence of any express recognition of carbon credits within the IBC. While the Code adopts a broad conception of "property,"[89] it neither classifies carbon credits as property nor addresses their treatment as assets in insolvency proceedings. This broad definition is not accompanied by corresponding regulatory clarity. In particular, the Companies (Registered Valuers and Valuation) Rules recognize only limited categories of assets and do not address the valuation, custody, or transfer of emerging intangible assets, whose existence and value are shaped by regulatory and registry-based systems.90 As a result, uncertainty persists as to whether carbon credits are intended to form part of the insolvency estate and, if so, how they are to be valued, transferred, or preserved during resolution or liquidation.

This statutory silence is compounded by the absence of custody or segregation rules for carbon credits. Neither the IBC nor the CCTS provides guidance on whether credits held by intermediaries, registries, or service providers are to be treated as client assets or as part of the intermediary's own estate in insolvency. As a result, carbon credits held through third parties risk being frozen, misclassified, or improperly disposed of during insolvency proceedings, particularly where registry-based ownership is not clearly aligned with legal title.

Further, the IBC does not provide any priority classification for claims arising from carbon credit transactions. As carbon-credit-related claims do not clearly fall within the definitions of financial or operational debt, they are likely to be relegated to the residual category of "other debts and dues" under section 53(1)(f).[91] This category is not well defined or elaborated upon in the Code,

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[89] Victory Iron Works Ltd. v. Jitendra Lohia, 2023 INSC 230 (India).

[90] Companies (Registered Valuers and Valuation) Rules, 2017, Rule 2(c) (India).

[91] *See* Insolvency and Bankruptcy Code, 2016, No. 31 of 2016, § 53 (India) ("(53) Distribution of assets.—(1) Notwithstanding anything to the contrary contained in any law enacted by the Parliament or any State Legislature for the time being in force, the proceeds from the sale of the liquidation assets shall be distributed in the following order of priority and within such period and in such manner as may be specified, namely:—

(a) the insolvency resolution process costs and the liquidation costs paid in full;

(b) the following debts which shall rank equally between and among the following:—

(i) workmen's dues for the period of twenty-four months preceding the liquidation commencement date; and

(ii) debts owed to a secured creditor in the event such secured creditor has relinquished security in the manner set out in section 52;

(c) wages and any unpaid dues owed to employees other than workmen for the period

leaving carbon credit holders exposed to the lowest priority in liquidation ignoring asset's immense environmental and market significance.

Although India has taken significant steps to establish a domestic carbon market through amendments to the Energy Conservation Act and the notification of the CCTS, the regulatory framework focuses primarily on market creation, governance, and trading infrastructure, not insolvency outcomes.[92] The institutional framework involving the National Steering Committee for the Indian Carbon Market, the Bureau of Energy Efficiency, the Grid Controller of India, and the Central Electricity Regulatory Commission establishes mechanisms for issuance, verification, registry maintenance, and trading.[93] However, it does not address the treatment of carbon credit certificates when regulated entities, intermediaries, or market participants enter insolvency. This regulatory-insolvency disconnect has created a significant structural gap.

B. Judicial Approach

Indian courts and tribunals have engaged with carbon credits primarily in the context of taxation and debt classification, rather than insolvency protection. This jurisprudence has had important consequences for how carbon credits are positioned within the IBC framework.

India's Supreme Court has consistently emphasised that a financial debt

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of twelve months preceding the liquidation commencement date;

(d) financial debts owed to unsecured creditors;

(e) the following dues shall rank equally between and among the following:—

(i) any amount due to the Central Government and the State Government including the amount to be received on account of the Consolidated Fund of India and the Consolidated Fund of a State, if any, in respect of the whole or any part of the period of two years preceding the liquidation commencement date;

(ii) debts owed to a secured creditor for any amount unpaid following the enforcement of security interest;

(f) any remaining debts and dues;

(g) preference shareholders, if any; and

(h) equity shareholders or partners, as the case may be . . . ").

[92] Energy Conservation (Amendment) Act, 2022 (Act No. 19 of 2022) (India); *see also Indian Carbon Credit Trading Scheme*, INT'L CARBON ACTION P'SHIP, https://icapcarbonaction.com/en/ets/indian-carbon-credit-trading-scheme (last visited Mar. 15, 2026).

[93] *See Carbon Pricing in India: Creation of National Steering Committee for the Indian Carbon Market* (*NSCICM*), PRESS INFO. BUREAU (June 23, 2025), https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=154721&ModuleId=3&reg=3&lang=2;, *Carbon Market*, BUREAU OF ENERGY EFFICIENCY, https://beeindia.gov.in/carbon-market.php (last visited Mar. 15, 2026).

must involve disbursal against consideration for the time value of money.[94] Applying this principle, carbon credit transactions that are structured as outright sales for a price do not qualify as financial debt. They involve no lending relationship, no deferred repayment, and no return linked to the passage of time. Consequently, claims arising from carbon credit transactions cannot be admitted as financial debt under the IBC.

Carbon credits also fail to qualify as operational debt. India's Supreme Court has interpreted operational debt to require a nexus with the provision of goods or services in the ordinary course of business.[95] Carbon credit transactions do not involve the supply of goods or services between the parties; instead, they involve the transfer of an entitlement generated through environmental performance. Consequently, claims based on carbon credits fall outside the scope of operational debt as well.

This dual exclusion has the effect of pushing carbon-credit-related claims into the residual category of "remaining debts and dues," a category that lacks doctrinal clarity and judicial elaboration. The absence of authoritative guidance on this category reinforces uncertainty in insolvency proceedings involving carbon assets.

Tax jurisprudence further complicates the position. In *Assistant Commissioner of Income Tax v Godawari* Power and *Ispat Pvt Ltd* and *My Home Power Ltd v Deputy Commissioner of Income Tax*, tribunals held that carbon credits constitute capital receipts, generated not as a result of business activity but as an outcome of environmental and international commitments under the Kyoto Protocol.[96] Carbon credits were characterized as transferable entitlements arising from global environmental concerns rather than as revenue-generating by-products of business operations. As capital accretions without a cost of acquisition, proceeds from their sale were held not to be taxable as income. While these decisions were rendered in the tax context, their reasoning has implications for insolvency. The classification of credits as capital receipts suggests that they arise independently of the debtor's core business operations and do not form part of its routine trading assets, complicating their treatment within the insolvency estate. Therefore, in the absence of any insolvency-specific guidance on the valuation or realisation of such capital entitlements, uncertainty remains as to how these credits are to be dealt with for the purposes of creditor satisfaction.

Practical difficulties are evident in insolvency administration as well. In disciplinary proceedings against an insolvency professional involving the sale of Verified Carbon Units during liquidation, regulatory authorities noted serious

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[94] Anuj Jain Interim Resol. Pro. for Jaypee Infratech Ltd. v. Axis Bank Ltd., AIRONLINE 2020 SC 279 (2020) (India).

[95] M/s Consol. Constr. Consort. Ltd. v. M/s Hitro Energy Sols. Pvt. Ltd., 2022 SCC Online SC 23 (India).

[96] Asst. Comm'r of Income Tax v. Godawari Power & Ispat Pvt. Ltd., Civil Appeal No. 9917 of 2017 (India); My Home Power Ltd. v. Dy. Comm'r of Income Tax, 27 taxmann.com 27 (Hyd. Trib. 2012).

procedural lapses—including failure to value the credits, failure to list them in the asset memorandum, and improper reliance on private sale mechanisms.[97] The case illustrates that, although carbon credits may be treated as assets of the corporate debtor, their administration in insolvency can be complicated by the absence of settled valuation and disposal practices for registry-based intangibles. At the same time, the disciplinary findings make clear that such uncertainty does not dilute the duty of care imposed on insolvency professionals, who remain required to act with diligence, seek appropriate directions, and ensure regulatory compliance when dealing with unfamiliar asset classes.

C. Systemic Consequences for India's Climate Commitments

These statutory and judicial gaps have broader consequences for India's climate policy objectives. India has ratified the Paris Agreement and committed to ambitious emissions reduction targets, including a 45 percent reduction in emissions intensity by 2030. Market-based mechanisms, including both compliance and offset instruments, play a central role in achieving these targets.

India has substantial experience with carbon markets through mechanisms such as the Clean Development Mechanism, Renewable Energy Certificates, and the Perform, Achieve and Trade scheme.[98] The transition toward a comprehensive Indian Carbon Market under the CCTS builds on this familiarity and institutional capacity.[99] However, the effectiveness of this framework depends on legal certainty across the entire lifecycle of carbon credits, including during insolvency.

Uncertainty regarding the treatment of carbon credits in insolvency can undermine investor confidence, particularly in long-term projects that rely on predictable credit issuance and transferability. The absence of clear rules on ownership, segregation, and priority increases the risk that credits may be frozen, undervalued, or lost during insolvency proceedings. This, in turn, can deter investment in emission reduction projects and weaken secondary market participation.

More fundamentally, insolvency-related uncertainty poses a risk to India's ability to leverage carbon markets in furtherance of its international commitments,

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[97] Insolvency & Bankruptcy Bd. of India, Disciplinary Comm., *Order in the Matter of Mr. Sai Ramesh Kanuparthi, Insolvency Prof'l*, Order No. IBBI/DC/175/2023 (June 7, 2023).

[98] See Press Info. Bureau, *Carbon Pricing in India: Creation of Nat'l Steering Comm. for the Indian Carbon Mkt. (NSCICM)* (June 23, 2025), https://www.pib.gov.in/PressNoteDetails.aspx?NoteId=154721&ModuleId=3&reg=3&lang=2.

[99] See Int'; Emissions Trading Ass'n (IETA), *India's Carbon Credit Trading Scheme: Business Brief* (July2025), https://www.ieta.org/uploads/wp-content/Resources/Busines-briefs/2025/IETA_Business_Brief-India_July_final-one.pdf.

including participation in mechanisms under Article 6 of the Paris Agreement.[100] Without alignment between insolvency law and carbon market regulation, carbon credits may fail to function as reliable economic instruments, thereby limiting their effectiveness as tools for decarbonisation.

V. POLICY AND LEGISLATIVE REFORMS FOR INDIA

India's insolvency framework must evolve to recognize that carbon credits are intangible, climate-based assets with tradable registry attributes whose stability directly affects market confidence, investment flows, and India's ability to meet its international climate commitments. The existing legal framework fails not because the IBC is conceptually inadequate, but because it was designed for a pre-climate-asset economy. This section diagnoses each identified weakness and offers solutions grounded in comparative best practices while remaining institutionally compatible with Indian law.

First, Indian law suffers from a foundational ambiguity that carbon credits remain undefined as a type of asset. While the IBC's broad definition of "property" could theoretically accommodate carbon credits, the absence of express recognition creates interpretive uncertainty for insolvency professionals, creditors, registries, and courts.[101] In contrast, the EU and UK treat emission allowances as intangible property, and UNIDROIT recognises proprietary rights in digital assets based on control, not physical possession.[102]

India may insert a statutory clarification within the IBC, either through an Explanation to Section 3(27) ("property") or a new definitional provision, explicitly recognizing that carbon credits, emission allowances, verified carbon units, and similar registry-based environmental instruments, whether issued under a statutory or voluntary framework, constitute intangible property for the purposes of IBC once validly issued and recorded in an authorised registry. Such clarification should be framed in expressly non-exhaustive terms, using language such as "includes, without limitation," to ensure that it is illustrative rather than restrictive. This reform does not create a new asset class— it merely removes doubt. It ensures that issued credits clearly vest in the insolvency estate (subject to third-party proprietary claims), insolvency professionals are legally compelled to identify, value, and preserve them, and courts need not engage in artificial characterization exercises.

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[100] See Rohini Pande, *Can the Market in Voluntary Carbon Credits Help Reduce Global Emissions in Line with Paris Agreement Targets?*, SCIENCE eadp5223 (2024). See also Shrishti Sharma & Palak Dogra, *Carbon Markets in India – Overview of the Legal Framework*, Alaya Legal (Aug.14, 2025), https://alayalegal.com/articles/carbon-markets-in-india-overview-of-the-legal-framework/.

[101] "Property", supra note 24.

[102] Armstrong , supra note 69; Eur. Comm'n, supra note 71 ; UNIDROIT, P. 20, supra note 53.

Importantly, pre-issuance or ex-ante credits should be expressly excluded from this definition, clarifying that they remain contractual expectations rather than property, thereby aligning insolvency outcomes with economic reality.

Second, carbon credits exist only as registry entries, yet Indian law provides no guidance on whether registries are merely evidentiary or constitutive of ownership. This creates severe risks during insolvency, where control over registry accounts determines whether credits can be transferred, retired, or monetized. Notably, the EU resolves title disputes by giving statutory primacy to registry entries, enabling good-faith acquisition and legal certainty, and UNIDROIT adopts a control-based proprietary model, recognising ownership based on factual and legal control over the digital asset.[103]

India may statutorily recognise registry-based control as the decisive indicator of ownership for carbon credits. This can be achieved through coordinated amendments to the CCTS, and Rules issued under the IBC. The framework should provide that:

a) Entries in an authorised carbon registry constitute prima facie and sufficient evidence of ownership.

b) Upon commencement of CIRP or liquidation, the resolution professional or liquidator is deemed to assume lawful control over the debtor's registry accounts, without requiring additional contractual consent.

c) Registries are under a mandatory statutory obligation to recognise insolvency practitioners and facilitate account access, transfers, or retirements.

This reform directly addresses the practical paralysis observed in insolvency proceedings and ensures that registry rules cannot override insolvency law through private discretion.

Third, India lacks any legal framework governing custodial holding of carbon credits. As a result, credits pooled in intermediary accounts are vulnerable to being swept into the custodian's insolvency estate, converting proprietary expectations into unsecured claims. On the other hand, UNIDROIT introduces a default presumption of segregation, insulating client-held digital assets from custodian insolvency.[104] India should adopt a statutory segregation regime for carbon credit custody, modelled on UNIDROIT Principle 17 but adapted to Indian conditions. Such a presumption should arise only where specified conditions evidencing client ownership and segregation are satisfied, so as to balance client protection with the legitimate interests of the custodian's general creditors. Key elements may include:

a) Presumption of Client Ownership (subject to conditions): Carbon credits held by an intermediary or custodian are presumed to be held on behalf of clients where the custody arrangement clearly evidences client ownership, including through express contractual terms, restrictions on the custodian's use or disposal of the credits, and corresponding registry or record-keeping entries.

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[103] ET v. Bundesrepublik Deutschland , supra note 72 ; UNIDROIT, P. 20, supra note 53.

[104] UNIDROIT, P. 16, supra note 53.

b) Ring-Fencing from Insolvency Estate: Client-held credits do not form part of the custodian's insolvency estate and are immune from creditor claims.

c) Affirmative Duties on Insolvency Professionals: Upon custodian insolvency, the insolvency professional must facilitate the prompt transfer of credits to:

- the client's own registry account, or
- another nominated custodian.

d) Shortfall Allocation Rule: In pooled custody arrangements, any shortfall must first be met from the custodian's proprietary holdings, with residual losses shared proportionately among clients.

e) Protection of Custodian Creditors: The segregation presumption shall not apply to the extent that credits are used as proprietary assets of the custodian, or where custody arrangements fail to meet the statutory conditions for segregation, in which case such credits may form part of the insolvency estate for the benefit of general creditors.

Fourth, carbon credit claims currently fall into the undefined residual category under Section 53(1)(f), effectively granting them the lowest priority in liquidation. This outcome is doctrinally incoherent given the capital-asset nature of carbon credits and their role in financing long-term climate projects. Comparatively, the US treats credits as estate assets but allows regulatory obligations to shape outcomes, EU law integrates allowances into insolvency without relegating them to residual status, and UNIDROIT acknowledges that proprietary rights should survive insolvency distribution rules.[105]

India may introduce a distinct insolvency treatment for carbon credit-linked claims, differentiating between proprietary claims (ownership, trust, or segregated custody), which must be satisfied outside the liquidation waterfall; and transactional claims arising from carbon credit sales, forward contracts, or project finance.

For the latter, a new sub-category within Section 53 may be introduced, ranking carbon-credit-linked claims above residual dues but below unsecured financial debt, recognising their capital nature, their reliance on regulatory integrity, and their systemic importance to India's climate governance.

Lastly, registry insolvency remains the most catastrophic risk. If a registry fails, carbon credits risk losing functional existence. Indian law provides no continuity mechanism for registry failure, nor any cross-border coordination rules. In contrast, EU registries operate under statutory continuity guarantees.[106] India may designate authorised carbon registries as systemically important market infrastructure, subject to:

a) Continuity obligations, including mandatory data escrow and migration protocols.

b) Statutory succession mechanisms, allowing the government or a

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[105] See IOSCO, supra note 8; UNIDROIT, supra note 53.

[106] ET v. Bundesrepublik Deutschland , supra note 72.

designated authority to assume registry operations during insolvency.

c) Conflict-of-laws rules, clarifying that proprietary questions relating to carbon credits are governed by the law of the registry, while insolvency proceedings follow the Center of Main Interest ('COMI') principle under the IBC and UNCITRAL Model Law.

Ultimately, carbon credits cannot function as credible climate instruments if their legal existence evaporates during financial distress. Insolvency law is not neutral in this context; it is either a stabilising force or a systemic risk amplifier. By integrating carbon credits into the IBC through express recognition, custody protection, registry primacy, calibrated ranking, and continuity safeguards, India can achieve three objectives simultaneously. It could protect market participants without privileging speculation, encourage long-term climate investment aligned with national targets; and position itself as a global leader in climate-aligned commercial law.

VI. CONCLUSION

Carbon credits now occupy a dual position in contemporary legal systems. They are simultaneously instruments of climate governance and objects of significant economic value. Yet, insolvency law has struggled to keep pace with this transformation.

In India, the absence of express statutory recognition of carbon credits within the IBC, coupled with fragmented carbon market regulation, has produced a zone of legal uncertainty where ownership, custody, and priority remain unclear. Comparative experience from the EU, the UK, the USA, and the UNIDROIT framework reveals a converging consensus that carbon credits are best understood as registry-based intangible assets capable of proprietary protection. However, these jurisdictions also demonstrate that insolvency outcomes are shaped not merely by asset classification, but by the surrounding institutional architecture governing registries, custody, and enforcement. Without deliberate alignment between insolvency law and carbon market design, even well-functioning markets remain vulnerable to disruption at moments of financial distress.

India stands at a critical juncture. As it constructs a domestic carbon market and positions carbon trading as a central pillar of its climate strategy, legal certainty in insolvency is no longer a peripheral concern but a structural necessity. By adopting targeted reforms that recognise carbon credits as insolvency-relevant property, protect client-held credits from intermediary failure, confer legal primacy on authorised registries, and calibrate insolvency priorities to reflect the unique nature of carbon assets, India can reconcile creditor protection with climate resilience. Such an approach would not only safeguard market confidence and long-term investment but also signal India's willingness to integrate private law, insolvency policy, and environmental governance into a coherent legal framework. In doing so, India has the opportunity not merely to borrow from comparative models, but to articulate a globally relevant blueprint for governing climate assets in an era where financial distress and climate ambition increasingly intersect.