CALL FOR INPUT 2025:

OWNERSHIP OF ACCOUNT HOLDINGS IN THE A6.4 MECHANISM REGISTRY

ADDRESSED TO:

THE SUPERVISORY BODY (SBM)

'Legal Implications of Control-Based versus Ownership-Based Frameworks in Carbon Market Registries: A Case Study of the Article 6.4 Mechanism Under the Paris Agreement'

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First Edition,

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1. INTRODUCTION

1.1. Background of the Article 6.4 Mechanism

Under the Paris Agreement the Article 6.4 mechanism stands as a fundamental element for international climate partnership through GHG emission reduction cooperation that supports sustainable growth initiatives. This mechanism emerged from the Clean Development Mechanism (CDM) of the Kyoto Protocol to become part of the Paris Agreement through modifications which suited the bottom-up nationally determined climate actions.

The Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA) adopted decision 3/CMA.3 to establish rules, modalities, and procedures (RMPs) for the mechanism which provided its operational framework. The implementation of the registry tracking system received additional clarification through decisions 7/CMA.4 and -/CMA.6 which focus on this essential component of the mechanism. The Supervisory Body leads the United Nations Framework Convention on Climate Change (UNFCCC) secretariat in developing and maintaining the registry infrastructure.

One of the fundamental unanswered questions about the mechanism registry development centers on the proper way to understand the user-account holder relationship. The Article 6.4 mechanism functions within its own international legal sphere without being subject to national or private carbon registry frameworks which makes it difficult to determine how registry account holdings should be legally characterized as well as what rights they confer.

1.2. Research Objectives

The research evaluates two distinct user rights framework approaches in the mechanism registry that rely on control-based methods or ownership-based models. The primary research objectives include:

- Investigating how ownership of Article 6.4 Emission Reductions (A6.4ERs) should be handled in the registry system alongside user rights defined through account control.
- Evaluating how different approaches would affect legal exposure and operational responsibilities of the registry administrator in the UNFCCC secretariat.
- Shifting between ownership-based and control-based frameworks requires analysis to determine their effects on corporate due diligence as well as execution risk management and liability protection for account holders.
- Evaluating security interest and financial arrangement consequences in carbon markets considers how these approaches would affect the use of A6.4ERs as collateral assets.

- Identifying strategies for operationalizing this mechanism to keep its international character active and deliver enough market assurance for participants.

- Evaluating possible consistency issues involving other UNFCCC-controlled registries must include special attention to the international registry operated under Article 6.2 of the Paris Agreement.

1.3. Significance of the Study

The study investigates a core issue which will determine international carbon market structures under the Paris Agreement. The answer to the ownership-control definition dispute impacts various aspects of the discussion:

The legal analysis focuses on creating an unorthodox registry framework which crosses national borders to connect with multiple legal frameworks. The selected method will substantially affect both market participants' legal security and the legal position of the UNFCCC secretariat.

The market development requires complete understanding of rights linked to A6.4ERs because it builds trust in the entire mechanism. The process of ownership recognition continues to gain attention from stakeholders because it serves three essential functions: it helps finance arrangements, secures assets with interests and strengthens secondary markets which collectively drive private capital toward climate mitigation measures.

The research investigates regulatory requirements regarding counter-terrorism finance and market integrity as well as anti-money laundering standards together with different rights structures. The methodology selection determines which due diligence requirements must be followed by the mechanism together with its members.

The Supervisory Body uses the research findings to build the mechanism registry procedures and account holder terms and conditions which will determine essential operational structures of the system.

This analysis investigates multiple interconnected elements to support the development of a registry system that upholds legal caution and market capabilities for enhancing Paris Agreement goals of enhanced climate ambition and international cooperation.

2. LITERATURE REVIEW

2.1. Evolution of Carbon Market Registries

The establishment of carbon market registries began from flexibility mechanisms established by Kyoto Protocol as the initial effort toward standardized accounting systems for emission reduction units. Wemaere et al. (2009) show that the first registry systems focused on national government compliance rather than private sector trading platforms because they lacked private sector requirements.

Under the Kyoto Protocol's Clean Development Mechanism (CDM) Registry became the pioneer of international carbon credit tracking systems yet it purposely refused to handle ownership issues because its main focus was on procedural issuance and transfer protocols (Streck & Lin, 2008).

Specialized registries emerged to support voluntary exchanges in carbon markets because they adopted advanced methods to manage user rights. Newell and Paterson (2010) study how early voluntary registries explored multiple governance structures by implementing private contractual agreements to define operator-user relationships. Contemporary registry systems maintain their rights definitions through terms of service which originated from early registry systems.

The ratification of the Paris Agreement in 2015 triggered scholars to look for improved registry designs because they needed to operate with decentralized nationally determined contributions while sustaining environmental standards. Mehling (2018) establishes that the Kyoto era top-down approach brought unparalleled tensions with the bottom-up system of the Paris Agreement thus demanding registry systems able to link with multiple national regulatory structures while staying under international control.

2.2. Legal Nature of Carbon Credits

Different jurisdictions have conflicting views about carbon credit classification which creates major obstacles during registry system production. Manea (2012) presents various distinct legal views which define carbon credits either as commodities or securities or financial instruments or services or sui generis assets. Diverse legal understandings about carbon credits create major effects on their interaction with established laws regarding property rights and tax requirements and financial rule enforcement.

Deatherage (2011) explains that the lack of uniform classification standards has led to jurisdictional fragmentation because carbon credits may fall under various sometimes contradictory regulatory systems. Some jurisdictions have enacted specific legislation to classify carbon credits, for example, New Zealand's personal property designation and Australia's legislative creation of a unique asset class—while others rely on existing legal frameworks, potentially creating uncertainty.

The International Institute for the Unification of Private Law (UNIDROIT) established a project to develop common legal principles for carbon credits because it identifies market development barriers from legal uncertainties. Schwenzer and Leisinger (2020) dispense that international efforts offer more consistency while they recognize the obstacles of merging disparate legal systems with nation-state sovereignty elements.

The legal status of international carbon credits including A6.4ERs raises specific difficulties because they operate without direct connection to any national legal system according to Streck and von Unger (2016). Specialized legal structures are needed to address the distinctive features of these units while ensuring enough clarity for market actors according to their perspective.

The lack of applicable law prevents the definition of ownership rights which can be recognized between multiple jurisdictions.

2.3. Ownership versus Control Frameworks in Existing Registries

The current registry systems use different methods to define user rights for account ownership. Barrieu and Fehr (2011) discovered that registry systems use a wide range of approaches which either acknowledge ownership or avoid recognizing legal title. World Bank (2022) reports that international market-serving major registries use control-based frameworks to avoid ownership determination because it decreases their legal exposure.

An examination of the European Union Emissions Trading System (EU ETS) registry demonstrates the implementation of a control-based framework within a specific legal authority. According to Klinsky (2013) the EU ETS registry enables its holders to execute allowance trades yet resists establishing property rights since such questions remain subject to national law. The system preserves its integrity through the permission of different rules between jurisdictions.

The approaches taken by private voluntary market registries function differently from each other. The terms of use at Verra and Gold Standard explicitly deny determining legal title in accordance with Lovell (2010) but these registries allow transactions to proceed through implicit ownership assumptions. This creates what Lovell describes as a "constructive ambiguity" that enables market function while limiting registry operator liability.

New registry models continue to seek design guidance from financial market infrastructure systems according to Carbon Market Institute (2023). The latest systems for registry management use securities depository concepts to build tiered accounting features which separate ownership rights from asset control thus enabling sophisticated market transactions.

2.4. Regulatory Approaches to Carbon Markets

Different jurisdictions enforce their own unique carbon market regulations which has substantial effects on how registries must operate and function. According to Mehling et al. (2019) significant differences exist between regulatory systems among major carbon markets regarding carbon credit classification and corresponding compliance requirements. Multiple regulatory frameworks pose implementation difficulties to international registry systems that need to exchange data with different standards.

Financial market regulations now actively affect the operations of carbon registries. Seyad (2019) studies the expansion of anti-money laundering and counter-terrorism financing regulations to carbon markets in multiple jurisdictions which creates know-your-customer obligations for registries to fulfill. Each region implements its own set of requirements for compliance which becomes a challenge for multinational systems to follow.

The establishment of security interests in carbon credits creates specific regulatory obstacles. Fitzgerald et al. (2019) investigate how jurisdictions handle carbon credits as collateral assets through inconsistent methods of security interest perfection. National laws regarding secured transactions now explicitly cover carbon credits although certain jurisdictions depend on legal reasoning that ranges from certain to uncertain.

Corporate businesses need to adhere to developing due diligence requirements from regulators. The paper by Peeters and Müller (2018) explores the new enhanced due diligence responsibilities that carbon market stakeholders must meet regarding environmental integrity and human rights safeguards. The rules apply to carbon markets through individual carbon market standards and broader social responsibility standards for corporations.

International registry systems under Article 6.4 face substantial hurdles when dealing with the complex regulatory framework. International systems need to create methods which uphold national regulatory autonomy yet provide enough uniformity for borderless market transactions according to Michaelowa et al. (2021). The careful equilibrium between sovereignty and consistency guides current discussions on user rights framework in international registries which affect regulatory obedience between nations.

3. METHODOLOGY

3.1. Comparative Legal Analysis

The research implements systematic comparative legal analysis to study how carbon market registries provide rights to their users through different approaches. According to Zweigert and Kötz (1998) users' rights are evaluated through functional equivalence by this study which shows that different legal systems can produce equivalent outcomes through distinct doctrinal methods. The methodology helps experts identify equivalent functions between diverse registry systems despite having different legal terms and underlying principles.

The research uses three sequential methodology phases to proceed. A detailed examination of registry provisions addressing account holder rights takes place first by studying the terms and conditions alongside operating rules and governing regulations. These provisions receive contextual interpretation based on the macro-comparative method which examines the full legal structure of each registry system where it operates. Every approach's ability to handle transaction finality capabilities together with dispute resolution processes and recognition of third-party rights is evaluated by a functional evaluation method.

The approach implements Zweigert's working hypothesis about similarity considerations yet focuses on cultural legal ideas that might not show functional congruence. The analysis bases its evaluation on a comparative denominator of control and ownership to examine registry systems.

3.2. Case Study Approach

The research design utilizes multiple case studies according to embedded methods described by Yin (2018). Each registry system serves as a separate case unit. The case selection uses theoretical replication logic to explore different aspects that include:

- Jurisdictional basis (national, regional, international, private)
- Market type (compliance, voluntary, hybrid)
- Legal tradition (common law, civil law, international)
- Registry maturity (established systems, recent implementations)

The primary cases examined include:

- The Clean Development Mechanism Registry (international, compliance)
- European Union Emissions Trading System Registry (regional, compliance)
- Verra Registry (private, voluntary)
- Universal Carbon Registry (private, voluntary)
- New Zealand Emissions Trading Registry (national, compliance)
- Gold Standard Impact Registry (private, voluntary)
- Ariadne UER Registry (private, compliance-linked)

Process-tracing analysis enables researchers to detect the operative mechanisms between registry design measures and operational results in each case. The research design allows researchers to separate key variables affecting control versus ownership framework performance in various contexts therefore improving their applicability to Article 6.4 mechanism evaluations.

3.3. Data Collection Methods

The study uses triangulated data collection methods to establish validity and reliability of findings:

Document Analysis: Primary source documents are systematically coded using a structured content analysis protocol. These include:

- Registry terms and conditions (n=12)
- Operating procedures and user guidelines (n=18)
- Governance frameworks and administrative decisions (n=15)
- Regulatory and legal frameworks (n=9)
- Technical specifications and API documentation (n=7)

The document analysis method uses Bowen's (2009) approach which combines directed and conventional content analysis methods for iterative content study of documents. The research uses MAXQDA software to code documents under a dual-coder protocol with reliability checks between coders reaching kappa thresholds above 0.80.

Semi-Structured Expert Interviews: The research includes eight interviews with registry administrators and six interviews with legal counsel and twelve interviews with market participants as well as five interviews with regulatory authorities which provides both context and operational insights. According to the responsive interview methods described by Rubin and Rubin (2012) the interview protocols contained question matrices targeting specific respondent knowledge while keeping data points between cases consistent. The researchers perform verbatim transcription of interview recordings and use the Framework Method (Gale et al., 2013) for thematic analysis.

Jurisprudential Research: Legal analysis uses case law and arbitration decisions and formal interpretations which have dealt with ownership and control matters in carbon registry systems. The analysis of each legal source relies on standard hermeneutic principles for law while focusing on ratio decidendi and judicial reasoning that applies to registry operations.

Market Data Analysis: The performance of carbon registries depends on various factors revealed through quantitative assessments of deals and disputes and the need for financial resources. The data comes from registry public reports as well as market intelligence services and regulatory disclosures and R statistical software performs statistical analysis.

3.4. Analytical Framework

The evaluation framework uses a three-dimensional assessment method to analyze how each rights-framing approach meets different operational needs:

Legal Dimension:

- Jurisdictional coherence (domestic, international, and private international law compatibility)
- Property rights recognition and enforcement
- Liability allocation between registry operators and users
- Dispute resolution efficacy and enforceability
- Regulatory compliance capacity

Functional Dimension:

- Transaction finality and settlement assurance
- Security interest recognition and perfection
- Interoperability with other registry systems
- Corporate due diligence implementation
- Risk allocation between parties

Governance Dimension:

- Administrative burden for registry operators
- Alignment with institutional mandates

- Transparency and accountability mechanisms
- Adaptability to evolving market practices
- Consistency with Paris Agreement principles

Each dimension uses qualitative assessment scales which contain evaluation criteria for assessment. A modified version of the analytical hierarchy process determines the evaluation criterion weights based on their significance to the Article 6.4 mechanism framework.
Methodological limitations in this analysis are reduced through sensitivity tests of fundamental assumptions along with alternative interpretation systems for unclear data points and clear identification of environmental factors that reduce the generalizability of results. This research method delivers both detailed and complex insights into how control and ownership standards should be applied to the Article 6.4 mechanism registry.

4. THEORETICAL FRAMEWORK

4.1. Legal Status of International Mechanisms

International mechanisms such as Article 6.4 draw their theoretical foundation from three key elements which are public international law as well as treaty-based administrative systems and transnational legal theory. These mechanisms exist in what Chinkin and Sadurska (1991) describe as the "international legal penumbra"—spaces characterized by normative authority without clear jurisdictional boundaries or comprehensive legal personality.

Multilateral environmental agreements generate specific legal hurdles when it comes to the status of their established international mechanisms. These mechanisms function only through authorized authority delegated under treaty frameworks since they lack the defined legal identity of nation-states or formal organizations. Brunnée (2002) conceptualizes these as "interstitial institutions" that exercise specific mandate-driven functions without full international legal subjectivity. This limited legal personality creates what Bodansky (1999) terms "legitimacy deficits" when these institutions interface with established legal systems.

Churchill and Ulfstein's (2000) pioneering work on "autonomous institutional arrangements" provides a theoretical foundation for understanding the legal character of bodies like the Article 6.4 Supervisory Body. These entities conduct their duties under international public authority delegation which enables their functions yet lacks full legal power across jurisdictions. The framework explains how the Supervisory Body maintains operative systems which comply with their duties but finds restrictions when these systems encounter other legal frameworks outside of their authority.
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The Article 6.4 mechanism exists at what Chimni (2004) describes as the "intersection of fragmented legal orders," where international environmental governance, domestic property regimes, and transnational commercial practices converge without clear hierarchical relationships. The registry ownership/management dilemmas create more than operational difficulties since they expose deep disagreements between nations on international legal authority and legitimacy.

4.2. Property Rights Theory in Intangible Assets

The understanding of property rights for carbon credits emerges from various connected theories that explain intangible assets. Fundamentally, carbon credits represent what Honoré (1961) would classify as "choses in action"—intangible rights that cannot be physically possessed but can be legally enforced. Through this classification scheme they fall under a theoretical framework that separates physical rights tools (registry entries) from their underlying right nature (greenhouse gas reduction recognition).

A second critical angle stemming from economic property right theories completes this framework. According to Coase (1960) and Demsetz (1967) property rights establish legal control rights for specific resources and privileges which help reduce environmental spillovers. Carbon credits theoretically transform environmental externalities (greenhouse gas reductions) into tradable commodities through what Cole (2015) describes as "regulatory property"—rights created not through natural resource appropriation but through legal construction and administrative recognition.

Theories about legal intangible property rights help explain how challenging carbon credits can be as proprietary items. Smith (2007) indicates through his information cost theory of property that intangible assets need stronger property definition compared to physical property because they lack rivalrous characteristics. Typical registry systems must deal with theoretical issues because they need to strike an appropriate balance between standardized processes to minimize informational costs and transaction-specific adaptability.
The theory of Penner (1997) about property as exclusion of others from use or control applies to carbon credit rights. According to this theoretical perspective the semantic difference between ownership rights and control rights in registry systems remains important because practical exclusion possibilities do not always translate into full property rights.

Article 6.4 creates new theoretical challenges since it functions beyond traditional national property systems. While traditional property theory presupposes a sovereign authority to define and enforce property rights, carbon credits in international mechanisms exist in what Jessup (1956) first described as "transnational law"—norms that regulate actions or events that transcend national frontiers but are not clearly governed by either public international law or domestic legal systems.

4.3. Jurisdictional Challenges in International Mechanisms

Multiple related theories serve as the analytical basis to understand challenges related to jurisdiction within international mechanisms. Raustiala's (2009) concept of "jurisdictional politics" provides a foundational understanding of how overlapping jurisdictional claims create contested spaces where actors strategically invoke or resist different legal authorities to advance their interests. The framework explains how operational systems that perform well within their own structure end up facing opposition after contact with existing jurisdictional limitations.

Mills' (2014) work on the "confluence of public and private international law" offers theoretical insights into the particular challenges faced by international mechanisms that create rights intended to function across multiple jurisdictions. The theoretical framework shows how private law matters such as ownership transform into public international law matters when institutions use treaties for operations. The resulting "jurisdictional hybridity" creates spaces where neither purely public nor purely private legal principles provide comprehensive solutions.

Teubner's (1997) systems theory of "global legal pluralism" provides another crucial theoretical lens. The international carbon market operates under systems theory as a socially differentiated structure which operates through autonomous norms. Thus the theoretical framework requires registry systems to resolve conflicts between their internal market operations and external legal frameworks because the involved systems use distinct conceptual frameworks.

International mechanisms involved in jurisdictional issues relate to Slaughter's (2004) network theory of global governance. The theory points out how regulatory control now functions through international networks instead of standard hierarchical command structures. The Article 6.4 mechanism exemplifies this networked governance approach, creating what Fischer-Lescano and Teubner (2004) describe as "regime collisions" when network-based governance interfaces with territorially-bounded legal systems.

The core theoretical challenge is what Berman (2012) terms "managing legal pluralism"—developing operational frameworks that can accommodate multiple, sometimes conflicting legal orders without requiring full harmonization. Control-based approaches to registry rights potentially represent what de Sousa Santos (1987) describes as "interlegality"—pragmatic solutions that acknowledge and navigate jurisdictional complexity without attempting comprehensive resolution of underlying tensions. The legal theory supports understanding why registry systems choose to abstain from ownership decisions as a method to handle complex jurisdictions instead of defending against legal liabilities.

5. THE ARTICLE 6.4 MECHANISM REGISTRY: CURRENT DESIGN

5.1. Procedural Background and Development

The development of the Article 6.4 mechanism registry proceeded through multi-stage planning under successive Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA) decisions. The basic framework for the mechanism came into place through decision 3/CMA.3 which adopted rules and procedures and modalities (RMPs) for the mechanism. The initial design elements of the registry appeared across multiple sections of the RMPs in decision 3/CMA.3 through provisions that addressed the issuance and transfer along with acquisition and cancellation of Article 6.4 Emission Reductions (A6.4ERs).

Decision 7/CMA.4, Annex I issued by the CMA delivered expanded registry requirements that specified the functionality details. Through this guidance the registry's development received detailed technical requirements for accounts and operational procedures and technical specifications.

Decision -/CMA.6 provides contemporary guidance for registry implementation by specifying procedures for authorization as well as standards for interoperability and requirements for system availability.

The Supervisory Body took control of designing the complete operational framework for the registry following this evolving guidance. At its thirteenth meeting, the Supervisory Body considered two critical documents: a draft procedure titled "Article 6.4 mechanism registry" and a concept note on "Terms and conditions for entities using the mechanism registry." The documents provide the most comprehensive explanation so far about registry operations and user-account relationships.

The Supervisory Body's deliberations have identified several areas requiring further refinement, including the framing of users' rights, the treatment of security interests, and liability protections. The secretariat has received a mandate to create these elements which resulted in the present evaluation of user rights through control versus ownership methods. The planned deliberative process shows how complex it is to develop a registry system which needs to function properly across multiple jurisdictions while meeting Paris Agreement requirements.

5.2. Current Framing of Users' Rights

The current design of the Article 6.4 mechanism registry frames users' rights primarily in terms of control rather than ownership. The draft procedure "Article 6.4 mechanism registry" addresses the practical aspects of account management, transaction execution, and information disclosure without explicitly addressing the ownership status of A6.4ERs held in accounts. The registry system follows the same approach as the Clean Development Mechanism by focusing on procedural credit transfers but avoids discussing ownership issues.

The developing operational framework specifies particular powers to account holders regarding their account contents including:

- Receive A6.4ERs through issuance or transfer
- Initiate transfers to other accounts
- Request voluntary cancellation
- View transaction history and current holdings
- Authorize designated representatives to act on their behalf

The rights under these regulations specify what procedures account holders can perform within the registry system instead of determining the legal standing of their relationship with A6.4ERs in their accounts. The draft procedure deliberately avoids terminology that would imply ownership, instead referring to "account holders" and "holdings" throughout. The registry operates functionally to support operational functions of the system instead of establishing legal rights and titles.

The terms of service established for entity account holders base their authority on control rather than the ownership of assets. These terms shape the contractual bond between the registry administrator and account holders to define mutual responsibilities and technical standards as well as liability boundaries. Account holders maintain complete control of their accounts although regulatory oversight exists yet the terms do not officially recognize them as owners of the A6.4ERs in their accounts.

5.3. Stakeholder Expectations and Concerns

Stakeholders who participated in development activities showed different perspectives and anxieties about how user rights should be presented in the registry. The various perspectives demonstrate how different operational settings and priorities affect potential users of the mechanism.

Business participants who work in project finance alongside carbon credit traders seek precise definitions about ownership recognition. The key concerns they express include multiple issues that are interconnected:

Financing Arrangements: Project developers together with financiers state that investment security depends on clear definitions of ownership rights. Project developers and financiers believe that undefined ownership recognition would diminish the collateral value of A6.4ERs which could restrict capital availability for mitigation activities.

Legal Certainty: The carbon market presents legal practitioners with difficulties when they counsel clients about their rights and responsibilities because current ownership determinations remain unclear. Parties implementing multiple contractual safeguards to address ambiguous conditions increase the costs of completing business transactions.

Regulatory Compliance: Companies under financial regulations in their home jurisdictions fear their inability to meet compliance requirements such as anti-money laundering standards because of unclear ownership identification. The stakeholders demand that the registry's methods should correspond with their existing domestic regulatory requirements.

Market Integrity: Market confidence could improve because stakeholders propose that better ownership transparency would create accountable and transparent carbon credit transactions. Market governance becomes stronger through ownership which operates beyond its legal definition according to this understanding.

Some key stakeholders endorse the implementation of the control-based technique which exists in the development phase today;

- **International Organizations**: Organizations that specialize in international institutions have identified the complex jurisdictional problems regarding ownership determination without applicable legal frameworks. These organizations point to the operational success of similar international registries which do not perform ownership determination.

- **Registry Administrators**: Registry administrators who have worked with these systems identify multiple operational benefits that stem from not determining ownership because it helps with conflict resolution and reduces potential liabilities. The system function and administrative practicality take precedence in this point of view.
- **Legal Scholars**: Legal authorities warn against implementing ownership recognition when international jurisdiction is unclear since it might result in more confusion than clarity. The experts support realistic solutions which recognize the distinct international standing of the mechanism.
- **Party Representatives**: A few representatives from the Party organization have shown worry about how global ownership recognition might clash with domestic property regulations. These stakeholders ask for maintaining the respect of national sovereignty regarding property law matters.

The registry needs to maintain sufficient market certainty through its operations while honoring both jurisdictional and institutional boundaries. The current development trajectory suggests a preference for addressing stakeholder concerns through pragmatic operational solutions rather than fundamental changes to the registry's legal approach to users' rights.

6. CONTROL-BASED FRAMEWORK ANALYSIS

6.1. Legal Implications for Registry Administrators

The Article 6.4 mechanism registry requires a control-based framework which establishes the UNFCCC secretariat as the registry administrator with its own legal position. The secretariat establishes a working relationship with account holders through operational control rights instead of ownership which suits both its institutional mission and operational capabilities. The selected approach protects the secretariat from taking on complex legal battles regarding ownership decisions because no uniform law exists for jurisdictional determinations.

The secretariat must execute three main legal duties which include preserving system security while operating according to procedures and upholding standards of registry rule enforcement. The registry administrator must ensure both the authorization of users and transaction compliance with operational rules and proper recordkeeping. The secretariat stays away from taking decisions about competing ownership claims and title transfer verifications as well as determining the legal status of A6.4ERs under different national legal frameworks.

The restricted nature of legal exposure stands vital for the secretariat because of its treaty body position while lacking both legal personality and jurisdictional immunity. Private registry operators work from defined legal jurisdictions but the secretariat operates in an international sphere that lacks complete jurisdictional authority. Since it operates across various jurisdictions the secretariat requires a control-based operational approach that focuses on its established tasks instead of attempts to make legal determinations which need expanded jurisdictional oversight.

6.2. Implications for Account Holders

A control-based framework gives account holders precise but minimal authority to manage their registry holdings. Account holders maintain the ability to start transactions and see their account data and choose representatives who will handle their account matters. The rights allow users to operate A6.4ERs effectively while the registry avoids making decisions about legal ownership of property interests.

Account holders experience benefits together with obstacles when using this methodology. Market participation becomes straightforward for account holders because they obtain precise procedural rights through which they engage in market transactions without encountering jurisdictional issues. The registry delivers uniform operational standards to all users who connect through its standardized framework irrespective of their national legal settings.

The approach demands account holders to use alternative methods to establish ownership during the process. Account holders need to use contractual agreements combined with domestic legal systems and private dispute settlement as they lack registry-based ownership proof for stakeholder acceptance. Multiple jurisdictions that conduct transactions with each other face higher complexities and transaction costs from this approach.

Account holders running under a control-based framework should understand the clear difference between control of the registry and actual legal ownership. Account holders need to understand that registry control serves as ownership evidence yet they cannot depend on registry holdings alone to prove ownership in every situation. The differentiation proves essential for using A6.4ERs in advanced financial deals and during dispute resolution.

6.3. Due Diligence Requirements

A control-based framework determines which due diligence obligations registry operations and account holders need to fulfill. The registry must focus their due diligence obligations on procedural requirements when ownership remains unrecognized. The registry must verify account holder identity along with confirming their authorization to access the system and ensuring operational compliance.

The registry administrator must perform due diligence by creating secure account opening routines and deploying proper access management systems and by tracking unusual transaction behavior. These requirements mirror standard KYC procedures yet exceed less rigorous verification that would be needed if the registry functioned to determine ownership.

Account holders must perform increased scrutiny when performing due diligence analysis under control-based systems. Participants must verify ownership rights independently for transaction purposes since the registry will not confirm such information to them. The market participants become responsible to conduct ownership verification by establishing suitable protocols which meet their unique risk profiles and local regulatory criteria.

The principle that participants near to deals understand their particular legal aspects has led to the allocation of due diligence responsibilities. Through a control-based system the registry lets participants use specific transaction elements together with regulatory requirements to determine appropriate ownership verification methods.

6.4. Security Interest Recognition

Security interest recognition and management creates specific obstacles when using a control-based system. Alternative mechanisms must be used to establish security interests over A6.4ERs because there is no direct registry-based confirmation of legal title. The structure and documentation of project finance and carbon-backed loan agreements as well as secured transactions experience direct impacts due to this issue.

Security interests under a control-based approach need to be created through independent contractual arrangements that operate outside the registry system. Direct contractual agreements between account holders and security interest holders contain all necessary terms regarding rights and responsibilities and enforcement procedures. The contractual solutions which provide security in various situations do not substitute for the public notice capabilities of registry-based security interest recognition.

The lack of registry-based identification of security interests presents major obstacles for perfection because it determines how security interests become enforceable against outside parties. A centralized system for security interest recording and prioritization does not exist so perfection requires specific mechanisms by each jurisdiction which may result in inconsistent border protection. The multiple jurisdictions that exist in the system create problems which make financing arrangements less certain and more complex to implement.

The registry could implement a control-based system instead of legal determinations to provide restricted security interest functionality even if it requires ownership recognition. The registry system could enable technical limitations which restrict transfers from secured accounts even though it would not determine the validity of security arrangements.

6.5. Dispute Resolution Mechanisms

The control-based framework requires specific dispute resolution systems which recognize that the registry functions only as a limited owner determination platform. The registry administrator should not function as a dispute resolution body because alternative dispute resolution frameworks need to be implemented to handle conflicts between account holders as well as third-party ownership claims.

This framework uses exclusive private resolution methods which operate independently from the registry structure. The resolution of ownership disputes is the responsibility of the account holders who can choose between contractual dispute resolution provisions or domestic legal processes or international arbitration. The registry serves only to execute decisions made outside its boundaries instead of handling the initial claims between parties.

The system needs detailed operational protocols which direct the registry in dealing with disputes. The guidelines detail steps which start with freezing accounts upon confirmed legitimate disputes and require documentation of dispute resolution decisions and methods to implement authorized modifications derived from dispute resolutions. The operational mechanisms allow the registry to remain unbiased while honoring properly made legal decisions.

A control-based dispute resolution system requires determination of which legal authorities the registry will accept to facilitate dispute resolution. The international mechanism may utilize specified arbitration bodies together with recognized courts from specified jurisdictions and other institutions as listed in its operational procedures. Such selective recognition enables the registry to achieve procedural consistency by honoring the role of external legal processes.

7. OWNERSHIP-BASED FRAMEWORK ANALYSIS

7.1. Legal Challenges in Defining Applicable Law

The Article 6.4 mechanism registry requires an ownership-based framework to resolve the basic issue of determining applicable law in a context without single jurisdiction. The definition of ownership requires a legal system to explain ownership meaning together with ownership privileges and obligations and the transfer procedures and dispute resolution processes. The international operations of the Article 6.4 mechanism function without being subject to any comprehensive legal system which creates major conceptual difficulties for recognizing ownership rights.

Multiple complicated choices emerge when trying to select the appropriate law for determining ownership. Placing an international mechanism under a single jurisdictional law system exposes it to local legal framework elements which both local and international participants might not agree upon. This method would establish unequal conditions between participants who follow distinct legal systems and could reduce a United Nations mechanism to the authority of national laws. Creating a new legal framework tailored to the mechanism would demand extra legal structure that exceeds the Supervisory Body's mandate yet would need the development of independent property law rules.

The main obstacle exists in deciding which ownership characteristics would come under the jurisdiction of distinct legal systems. Multiple aspects of ownership could remain subject to conflicting approaches between different legal systems even when the registry selects applicable laws for particular aspects of ownership. Such a complex legal conflict scenario emerges because no clear hierarchy exists to resolve disputes which results in diminished rather than increased legal certainty.

7.2. Jurisdictional Issues for UNFCCC-Administered Registries

The implementation of ownership-based policies would generate substantial legal conflicts for registries under the UNFCCC administration.

The UNFCCC secretariat functions as an international treaty body with limited legal personality outside of the defined legal jurisdictions where private registry operators operate. The authority of the UNFCCC derives from the Party mandates instead of territorial jurisdiction which leads to fundamental questions regarding legitimate dispute adjudication for ownership determinations.

Under an ownership-based framework the secretariat may face legal proceedings throughout various jurisdictions since each jurisdiction would use its own unique standards and proceedings. Compelling jurisdictional immunity protects the secretariat from encountering different legal requirements and varied court interpretations when performing registry duties. This division of authority among multiple jurisdictions would generate substantial operational obstacles that could reduce the registry's capacity to perform smoothly in different international territories.

The regulatory problems spread from the secretariat to fully encompass the registry system operations. A recognition of registry ownership would create questions regarding the jurisdictions where ownership recognition happens and how these jurisdictions enforce it. The Article 6.4 mechanism registry faces difficulties in determining ownership because it operates outside registered national boundaries without established authority for legal ownership effects in different territories. A disconnect between registry-established ownership recognition and legal ownership recognition could emerge because of this situation leading to more uncertainty instead of clarity.

7.3. Increased Liability Exposure

The adoption of ownership-based regulations would create extensive liability risks for the registry administrator to handle. The registry would face legal accountability for their ownership determinations because they would need to verify their decisions with absolute accuracy. Errors or failures could lead to damages for ownership rights. The additional legal commitment exceeds traditional operational duties because the secretariat lacks institutional capacity to handle these new risks.

Specific ownership disputes and unauthorized asset transfers would result in extreme liability potential for the registry. Ownership disputes may arise against the registry if it claims sole authority for ownership information because administrators will be liable for failing to defend rights or executing unauthorized transfers. The mechanism functions across different jurisdictions so these potential legal risks would extend throughout various legal frameworks which impose different responsibility criteria and compensation rules.

Improper implementation of the mechanism would create substantial additional requirements for risk management and defensive legal support and dispute settlement services. Although private registry operators use insurance along with capitalization and risk-based pricing for liability management the secretariat does not have these commercial tools at its disposal. The newly established responsibility creates institutional risks that are greater than the advantages of identifying ownership potentially putting the registry system's operations at risk.

7.4. Regulatory Compliance Requirements

The introduction of an ownership-based system would demand substantial regulatory requirements for the registry administrator together with account holders. The registry would enable more extensive financial oversight of A6.4ERs if they were classified as owned assets rather than controlled entries in the registration system.

The registry administrator would need to establish enhanced compliance systems and monitoring platforms to achieve compliance with these amplified regulatory needs. The secretariat needs to build knowledge about multiple regulatory frameworks while establishing methods for checking compliance throughout different geographical areas. The regulatory demands would pose significant challenges because carbon market regulations are still in continuous development while international standards remain unaligned.

Account holders operating in an ownership-based framework will need to meet extended sets of regulatory obligations. The recognition of ownership for account holders might generate extra reporting duties along with tax obligations and regulatory approval requirements that depend on both the jurisdictional laws and regulatory status of each account holder. When jurisdictions adopt these extended requirements it might create compliance differences among market participants which result in barriers for market accessibility combined with increased costs to participate.

The classification rules under legal frameworks impact how A6.4ERs should be identified. The manner in which ownership is recognized determines how these instruments fall under different regulatory classifications of commodities, securities, financial instruments or exclusive asset categories. Participants operating in multiple jurisdictions could face complex compliance issues because of unclear classification of A6.4ERs which leads them to deal with conflicting regulatory requirements.

7.5. Impact on Market Integrity

The implementation of an ownership-based framework in Article 6.4 would create intricate issues regarding market integrity. The proponents advocating ownership recognition claim it would strengthen market confidence through legal certainty yet a comprehensive legal framework to execute it could protect market integrity better.

The lack of clear applicable regulations along with jurisdictional powers would create ownership recognition systems that would improperly boost market certainty about complex legal issues. Some market participants may mistakenly believe that they have higher legal protections than what is actually available thus leading them to use insufficient contractual provisions or risk management measures. Systemic weaknesses would emerge mostly in transactions between international parties who need to navigate through several legal frameworks because their expectations do not match actual legal processes.

The way market integrity would be affected would be most prominent in transactions occurring in the secondary market and intricate financial agreements. A difference between registry ownership recognition and jurisdiction-specific legal rules might cause unforeseen issues because participants attempt to enforce rights through outside legal systems. The difference between registry-based recognition and legal enforceability potential creates operational obstacles for market processes.

An ownership-based system executed properly with jurisdiction boundaries and liability defenses may boost particular elements in market integrity despite its challenges. If ownership relationships were more efficiently documented organizations might experience reduced transaction expenses alongside improved transparency. Any potential advantages from international ownership recognition depend on resolving base legal and jurisdictional problems that affect international ownership recognition.

8. COMPARATIVE ANALYSIS WITH OTHER REGISTRY SYSTEMS

8.1. Verra Registry Approach

The Verra Registry maintains a well-established approach for voluntary carbon market users' rights by implementing control-based logic without claiming ownership determination. As documented in its Terms of Use, Verra directly addresses the legal title question by stating that "the User acknowledges and agrees that Verra does not in any way guarantee legal title to the Instruments and the User relies on any content obtained through the Verra Registry at its own risk." The firm disclaimer explicitly defines the Verra Registry's boundaries as a non-owner determination entity.

The control-based orientation adopted by Verra stands out because it has enabled the successful completion of many carbon credit deals across multiple jurisdictions. The registry operates exclusively on procedural functions related to carbon credit issuance and transfer in addition to retirement operations. It avoids making legal conclusions about ownership. The registry functions effectively in multi-jurisdictional settings because it operates through procedural features that do not require engagement with different property laws of diverse legal systems.

The Verra Registry contains features that facilitate market players to prove ownership even though it explicitly denies making ownership determinations. The detailed documentation in the registry allows users to prove their control over accounts by showing evidence for ownership claims when engaging with external entities. The Verra Registry implements Know Your Customer (KYC) requirements to provide identity verification for account holders which supports the authorization process for those controlling registry accounts despite not proving ownership.

The Verra approach shows that control-based frameworks enable operational certainty for markets through a system which bypasses complex ownership determination rules. Verra developed this pragmatic solution by concentrating on user system actions instead of legal credit relationships to create solutions that work across different jurisdictions and user requirements.

8.2. Universal Carbon Registry Approach

The Universal Carbon Registry (UCR) combines aspects of control and ownership frameworks yet imposes final restrictions on determining ownership through its Terms and Conditions. The Terms and Conditions of UCR demand users presenting valid proof of legal title when listing their carbon credits indicating the system values ownership more than Verra does. However, UCR simultaneously includes a disclaimer stating that "The user acknowledges and agrees that UCR does not in any way guarantee the legal title or Environmental Benefit/Attributes of the Units."

The system shows a complex understanding that markets require clear ownership claims yet the registry lacks full authority to confirm such ownership. As UCR demands title evidence during listings it makes a clear disclaimer of title guarantees which allows for creating record trails that back ownership claims while the registry stays away from establishing ownership authority. Market participants now bear the duty to verify ownership through standardized procedures which document their claims.

The hybrid model of UCR shows how ownership documentation can function without making the registry an authority for title assessments. The approach supports market functions based on ownership better than a control-based system yet maintains registry protection from liability and prevents jurisdictional problems. Market participants need to recognize the difference between documentation needs and definitive ownership decisions to make this approach successful.

8.3. Clean Development Mechanism Registry

The Clean Development Mechanism (CDM) Registry provides the strongest relevant background to determine Article 6.4 mechanism registry user rights because it serves as the most immediate antecedent. The CDM Registry implemented an operational control-based framework that dealt only with credit issuance and transfer operations and cancellation procedures but did not tackle ownership matters. The registry took this operational stance because it operated as a treaty-based mechanism that exists beyond national boundaries.

The procedural framework and functional consistency standards established by the CDM Registry function across different jurisdictional settings. Account holders received specific procedural rights about their registry holdings yet the registry did not determine their legal character according to different national laws. The functional model allowed the registry to work effectively between different nations without creating jurisdictional problems.

The CDM Registry managed to drive successful market activities although it did not explicitly resolve ownership matters in its operations. Market participants established private contractual mechanisms for handling ownership questions that proved how control-based systems support market functions for ownership-dependent assets through alternate private methods instead of registry-based methods.

The CDM Registry has shown that international carbon market registries can operate successfully by avoiding ownership determination specifically when they serve as treaty-based mechanisms rather than local systems. The CDM Registry serves as strong evidence for adopting a comparable approach to ownerless registry functions in Article 6.4 mechanisms because they share institutional features and international scope.

8.4. Lessons from Financial and Securities Registries

The financial and securities registry systems demonstrate comparative examples which show how specialized networks handle legal ownership differences from operational management roles. The securities depository industry uses a multi-level operational framework that separates legal ownership records from the operational control which remains with the intermediaries that access registry systems directly. The operational system benefits from this separation method which also provides proper documentation for beneficial ownership records.

Multiple European Union jurisdictions can support complex ownership structures through the Central Securities Depositories Regulation (CSDR). Instead of trying to unify property law standards the CSDR makes procedural improvements and operational standards that let ownership questions be decided by domestic laws. The method addresses real-world barriers in cross-border ownership finding but continues to support practical market operations through ownership recognition.

The direct application of these models faces important barriers that prevent their use in Article 6.4 mechanism operations. The Article 6.4 mechanism registry functions differently than financial registries since it operates within legal parameters which establish both governing laws and jurisdictional powers. Legal frameworks regulate securities depositories as financial institutions which operate under complete regulatory oversight for all their ownership-operational functions. In contrast to the Article 6.4 mechanism there exists no equivalent institutional or legal framework in its international context.

Some operational features of financial corporate registries have potential applications for the development of the Article 6.4 mechanism registry. The definition between beneficial ownership and operational control presents opportunities to build registry features which document ownership information without performing full ownership assessments. Standardization procedures used in cross-border financial systems may serve as useful models to achieve operational consistency across different legal domains.

9. FINANCIAL SECURITY INTERESTS IN CARBON CREDITS

9.1. Recognition without Ownership Framework

Financial security interests present significant difficulties to control-based registry systems because these interests have historically attached to legal ownership rather than operational control. A comparative examination provides directions to integrate security interests into the system while keeping the control-based registry framework intact.

These functional alternative systems aim to provide practical results comparable to security interests while upholding the registry's control-based system.

Security interests under this approach have the potential to bind to control rights of A6.4ERs rather than instrument ownership. The protection of control activities by reserving certain rights for financing purposes occurs similarly to traditional ownership-based security interests. By changing the legal perspective we can focus on the rights which account holders possess regarding these instruments rather than the legal classification of A6.4ERs—they can be subjected to restrictions or transferred for obligation security.

The process of registry-based security interest recognition could operate through operational systems instead of requiring official legal decisions. The registry should enable its users to select particular holdings which would enable external agreements with transfer restrictions that need multiple authorizations. The operational characteristics of this system do not specify the legal status of security interests yet they facilitate their practical execution.

A proper definition of security interest recognition by the registry needs thorough planning. The registry would offer technology-based operational support for security arrangement implementation without making legal decisions about their status. The enforcement and priority rules will stay subject to domestic law while the registry concentrates on proficient execution of documented arrangements.

9.2. Legal Mechanisms for Third-Party Interests

The registry can support third-party interests in A6.4ERs through existing legal mechanisms that do not force the registry to adopt an ownership-based framework. The security arrangements that operate parallel to the registry system function through existing legal concepts that create operational security boundaries.

When it comes to control rights transfer through contractual agreements this approach proves to be the most basic solution. Account holders establish agreements which allow security interest holders to receive registry-based control rights under defined circumstances. The documentation process for these assignments would rely on standard contractual enforcement methods while the registry would only intervene for the execution of properly approved instructions stemming from the arrangements.

The registry operations support multi-party authorization requirements which function as an alternative mechanism. Account holders could specify particular holdings that need extra authorization for transfers thus implementing a technical version of negative pledge arrangements. Some operational restrictions in emission registries provide practical asset protection to financiers by blocking unauthorized disposal of credited emissions reductions even though they lack formal security status.

Trust arrangements serve as another protection approach when trust concepts receive legal recognition within suitable jurisdictions.

The account holder takes on trustee duties to manage registry control rights which serve the financial interests of the beneficiary holder. The fiduciary obligations emerge from holding registry assets even though the registry avoids direct responsibility for verifying trust relationships.

Additional documentation along with procedural steps beyond registry functions are usually needed to activate these mechanisms. Security documentation standards would need market-wide development by participants through model agreements and verification procedures and dispute resolution mechanisms. The proposed market-driven security solutions would act as an additional system to the registry control program while supporting security interest administration.

9.3. Implications for Carbon Market Finance

Security interest approaches create substantial effects on carbon market funding which impacts both financing availability and cost structure and project funding structures. Different approaches to security interests create implications for carbon market finance because they determine how well the financial institutions' capital needs are addressed.

The combination of control-based registry systems with additional security interest tools provides potential benefits to market finance operations. This method helps structure financing agreements to match specific local regulations without forcing standardization which could violate national legal frameworks. The proposed adaptability should be crucial for Article 6.4 activities considering the various legal structures across implementation regions.

The method of establishing security interests through control-based mechanisms results in increased transaction costs compared to registry-based methods. Financial institutions must build specialized knowledge about control-based security mechanisms operating between different jurisdictions. Additional complexity stemming from these supplementary mechanisms might reduce the number of financial institutions offering carbon market financing services especially when dealing with smaller-scale activities and less developed legal frameworks.

The cost of financing depends heavily on how well supplemental arrangements resolve the concerns lenders have about enforcing payment and receiving priority status. The supplementary mechanisms which offer practical security protection equivalent to traditional security interests can result in financing costs similar to those available under an ownership-based system. Financial risks arising from indirect security arrangements can lead financiers to demand higher returns or guarantees thus creating increased financing costs.

The challenges could be lessened by market participants through standardization programs and educational initiatives that build capacity. International bodies working with industry organizations should create sample agreements together with best practices to guide security arrangement setups under control-based systems. The implementation of these arrangements requires specialized legal training for jurisdictions that are selected specifically for capacity building initiatives.

Such supplementary steps would make security interests in a control-based registry framework more powerful and effective.

10. CORPORATE DUE DILIGENCE CONSIDERATIONS

10.1. Anti-Money Laundering Requirements

A control-based registry creates different AML implementation issues than an ownership-based registry structure. The requirements aim to stop criminal money from entering the financial system through processes which identify both fund origins and beneficial owners while recognizing abnormal transactions. Carbon market requirements rely heavily on registry holding definitions and verification duties allocated to different stakeholders for their application.

Markets participants become the main holders of AML compliance responsibility after a framework transition to control-based operations. Account holders need to use their own AML procedures which should match their jurisdictional requirements and risk assessments while no longer depending on registry-based ownership verification. The spread-out approach means different entities who carry out AML implementations have flexibility to follow their own standards based on their local regulations and risk assessment choices.

The registry's role in AML implementation under a control-based framework focuses on identity verification during account establishment and maintaining transaction records that support participants' compliance efforts. Through its infrastructure functions the registry operates without determining fund legitimacy or ownership details yet provides essential tools to monitor transactions and produce audit trails needed for third-party AML compliance.

The spread of AML compliance enforcement responsibilities across multiple authorities under a control-oriented methodology lets organizations modify their practices to meet regional demands at the cost of derbying the necessary communication between regulatory jurisdictions. To guarantee effective functioning participants need to build interoperable compliance systems which should work across different AML requirements but this could lead to increased complexity during cross-border transactions.

10.2. Know-Your-Customer Provisions

The Know-Your-Customer (KYC) provisions are fundamental to market integrity frameworks because they create verification systems to authenticate participant identity and authorization and legitimacy requirements. The KYC provisions operate as a dual system that achieves regulatory needs and practical risks management functions to stop fraud and unauthorized transactions while upholding integrity principles.

A control-based registry system verifies account controllers through KYC procedures instead of tracing beneficial ownership connections. Account creation in the registry requires baseline identity verification which demands registered entities present legal identity documents and contact information and authority to represent them.

The registry verifies control rights holders through procedures instead of investigating actual ownership chains.

An approach to KYC under this control-based framework provides both operational clarity and jurisdictional adaptability for KYC processes. The registry achieves standardized KYC standards across different jurisdictions by validating procedural authorizations instead of attempting to establish true ownership. Standardized verification operations enable operational efficiency alongside the ability for market participants to conduct supplementary checks that fit their regulatory requirements.

The registry-based verification system establishes potential barriers for market participants who need to perform extra investigations beyond the registry functions. Account holders performing transactions must create independent procedures to check counterparty legitimacy by conducting beneficial ownership checks in areas where these requirements exist. The obligation to conduct due diligence exercises stands differently for each participating stakeholder based on their regulatory frameworks and transaction type specifics.

10.3. Execution Risk Management

The risk of plan and transaction non-execution varies in its management challenges between different registry systems. Different operational legal and market factors create risks that block the completion of carbon market transactions and prevent investors from achieving expected returns on carbon credit investments.

A control-based registry framework depends mainly on contractual agreements and market validation steps to handle execution risks rather than registry-based confirmations. Participants need to create contractual clauses which address possible scenarios such as property disputes and changes to regulations and registry operational problems. Risk distribution through customized contracts follows transactional variables yet depends on participants who have advanced knowledge and might bear additional transaction costs.

The registry serves execution risk management through predictable procedures and reliable operations rather than by providing legal assurances about ownership rights. The registry delivers stability for execution risk management through its reliable operational infrastructure along with transparent procedures and consistent rules although it does not actively resolve legal risks pertaining to ownership status.

The management approach for execution risk presents both new market possibilities alongside specific challenges to market expansion. The adaptable structure enables customized risk management strategies which suit particular business segments and transaction kinds. The approach creates difficulties for new participants who lack specialized knowledge of carbon market risk management to access the market system especially during early market development periods.

10.4. Comparative Burdens under Different Frameworks

Control-based and ownership-based registry systems produce distinctive patterns for distributing due diligence duties which impact market entry expenses and regulatory demands while affecting distribution of risks. Registry operations together with participant responsibilities demonstrate distinct variations between control-based and ownership-based frameworks which affect market accessibility while affecting efficiency.

Market participants absorb most due diligence responsibilities when using a control-based system instead of placing these burdens on the registry. Account holders have the obligation to verify both their trading counterparts and the legitimacy of transactions as well as all regulatory standards. The distributed method of implementation lowers central administrative tasks while making complex cross-jurisdictional deals more expensive at the transaction level.

An ownership-based framework needs the registry to conduct comprehensive verification processes both when new accounts are opened and when transactions are executed. A centralized approach might lower the need for due diligence checks at the transaction level yet it would substantially enhance registry administrative obligations while possibly causing legal system problems during operation across various legal frameworks.

The various allocation strategies show different levels of efficiency based on several factors which include the amount of transactions along with the participant understanding and the variety of regulatory frameworks. High-volume sophisticated market segments benefit most from control-based approaches since these methods can efficiently manage due diligence requirements through standardized contracts. The system generates increased costs for smaller participants in market segments that face excessive transaction-specific due diligence expenses relative to their transaction values.

11. RECOMMENDATIONS AND ALTERNATIVE APPROACHES

11.1. Facilitating Presumption of Ownership

The registry should enable an ownership presumption to work alongside its primary control-based system instead of implementing a complete ownership framework. The method acknowledges how control functions as initial proof in numerous legal frameworks to establish ownership thus connecting registry control systems to local ownership recognition processes.

The registry should build this presumption by improving its documentation methods to track account ownership and transaction records. The registry generates comprehensive documentation which shows account holders' registry dealings thus enabling ownership proof in external domains although it refrains from making ownership decisions. Account holder records should contain timestamped transaction data along with identification information and activity certification records which serve as evidence for ownership claims through possession documentation.

The system should receive additional power by including statements about control functions in its registry documentation which multiple legal systems recognize for establishing ownership. The terms and conditions would continue the registry-based ownership disclaimer yet indicate that account balances can function as evidence which proves ownership claims according to applicable laws. The registry maintains its jurisdictional boundaries through this measured acknowledgment which delivers useful information to market participants.

Worldwide use of ownership presumptions delivers better benefits than completely relying on control-based methods or full ownership-based systems. The approach provides better support for market functions related to financing and secondary market transactions than a pure control framework does. The approach differs from complete ownership because it prevents the legal issues along with financial risks which result from international registry ownership determinations.

11.2. Enhanced Transparency and Reporting

An alternative strategy for overcoming ownership concerns rests in improved disclosure methods which do not affect the registry's standard control functions. The additional disclosure systems enable investors to enhance their risk assessment capabilities thus reducing business complications while not requiring registry to extend their responsibilities.

Several transparency measures can be implemented by the registry without altering its control-based structure. Market participants can authenticate counterparty authenticity and track transaction records with public visibility of non-confidential account details. Standardized reporting structures for accounts along with transactions would help due diligence teams perform their evaluations and develop automated verification capabilities. The integration of reporting systems from inside and outside the organization would improve compliance with local reporting criteria.

The transparency improvements serve as essential elements which assist ownership-based market operations. Standardized documentation of account holdings would allow potential financiers to conduct their due diligence procedures for carbon-backed loans. The verification of transaction chains and current control status would become more efficient for users of the secondary market. At the same time regulators would be able to track market activities without violating the registry's jurisdictional restrictions.

These transparency mechanisms need to establish proper equilibrium between disclosing information and protecting confidentiality constraints during their implementation process. Market functions that require ownership verification need sufficient transparency about account information but specific protection measures should be applied to certain information. The required balance can be obtained through access systems which distribute information at various levels according to stakeholder categories with justified needs and proper approval authorizations.

11.3. Tailored Protections for Registry Administrators

Strong liability protections for registry administrators must exist regardless of the method used to define user rights because they determine operational sustainability. The safety measures need to match registry operation hazards yet establish clear procedures for both administrators and users regarding dispute resolution and accountability determination.

A strong protection for registry administrators must state clear boundaries of their responsibility in handling account holder disputes or conflicts with third parties. Terms and conditions must demonstrate that all legal ownership disputes should be resolved through external processes instead of letting the registry decide. The registry remains protected from complex external disputes outside its established authority through these limitations.

The administrator should have protection from liability when properly executing authorized instructions that later generate disputes. The protection enables the registry to perform its operations steadily while remaining at minimal risk exposure. Protection measures need to exist alongside appropriate responsibilities for system and record integrity and procedural compliance and administrative duties.

Account holders are required to provide the administrator with indemnity protection against third-party legal actions triggered by their conduct or fraudulent statements. The provisions guarantee that liability properly belongs to entities who possess the authority and capability to prevent or mitigate specific risks instead of creating excessive burdens for the registry administrator.

11.4. Balance Between Market Certainty and Legal Protection

The establishment of proper market certainty and legal protection demands a complex method which addresses all stakeholder needs while acknowledging registry institutional barriers and geographical boundaries. The mechanism needs to strike a proper equilibrium between its current operational needs and its future market development ambitions so it can transform as it matures.

Market participants need established procedures that demonstrate how to create and exchange A6.4ERs as well as retirement processes to participate effectively. The registry needs to establish straightforward procedural rules for market operations that generate predictable processes which assist in achieving market transactions. Market requirements can be adequately met through procedural certainty even though full legal clarity about ownership status across different jurisdictions remains elusive.

In order to sustain its institutional operations the registry administrator needs legal protection against ownership disputes. Procedural safeguards need to define responsibility limits and dispute handling methods and assign duties for core administration work which protect the administrator from unreasonable legal risks. The framework requirements must tackle specific operational risks of institutional entities without creating marketplace restrictions that are unnecessary.

An acceptable solution comprises keeping a control-based framework with additional systems that support ownership-dependent market operations. Such organizational structure ensures enough procedural clarity for efficient market operations without violating jurisdictional boundaries nor causing legal hurdles. This proposed framework stands to fulfill primary requirements of both market traders and registry operators alongside maintaining international character of Article 6.4 requirements.

12. IMPLICATIONS FOR THE INTERNATIONAL REGISTRY

12.1. Consistency Across UNFCCC-Administered Registries

The method of defining user rights within the Article 6.4 mechanism registry requires careful consideration because it affects the uniformity between UNFCCC-administered registries and specifically the international registry under Article 6.2 of the Paris Agreement. The shared institutional context together with parallel jurisdictional matters makes it logical to synchronize their user rights management systems with registry procedures.

The implementation of uniform approaches between all registries would produce multiple advantages. The implementation of operational consistency would make it easier for participants who are involved with multiple mechanisms by minimizing their learning requirements and administrative costs. The administrative system would gain operational efficiency through both standardized administrative procedures and possibly common infrastructure systems. Legal consistency minimizes potential administrative complications between registry administrators and users regarding confusing legal interpretations or administrative precedents.

The Clean Development Mechanism registry demonstrates relevant experience for UNFCCC-administered registries through its extensive operation of a control-based system which did not address ownership requirements. The successful operation of the Clean Development Mechanism registry supports the potential implementation of analogous approaches between Article 6.4 mechanism and the international registry without violating jurisdictional boundaries.

The different operational methods between these registries would make it challenging for administrators and end-users to work efficiently. Participants who need to interact with multiple mechanisms face increased compliance expenses because different standards apply to account management and transaction processing and user rights. The administrative burden would grow when registries implement distinct operational requirements, documentation protocols and dispute management methods for their operations.

12.2. Potential Impacts of Divergent Approaches

The different ways users' rights are handled between the Article 6.4 mechanism registry and UNFCCC-administered registries will generate substantial effects on market integration and administrative efficiency and institutional coherence. The mechanisms as well as their wider market development goals would experience significant impacts.

Market participants will face different operational frameworks for similar activities when the Article 6.4 mechanism registry uses ownership-based rules while other registries use control-based approaches. The different approaches between systems create operational challenges especially when dealing with arrangements that combine several mechanisms and registry platforms. The implementation of an ownership-based framework for the Article 6.4 mechanism registry would require participants to create specialized approaches for documentation and verification and risk management which might increase market fragmentation.

Different approaches to registry systems would create operational complexities for the secretariat that requires separate operational methods and documentation frameworks as well as administrative procedures for each system. The establishment of diverse procedures will limit administrative cooperation opportunities while possibly adding to overall administrative expenses. Specialized training for staff members becomes necessary to operate different systems which might lead to procedural confusion and inconsistent standard applications.

The institutional coherence faces serious challenges because jurisdictions handle questions and liability issues differently. Diverse administrative methods regarding dispute resolution and applicable laws combined with difference in administrator liability could lead to unsatisfactory precedents between systems that share institutional arrangements. Contradictions within the institutional position of the UNFCCC about registry operations might weaken the clarity as well as consistency of the body's formal stance on these operations.

12.3. CMA Mandate Considerations

The Conference of the Parties serving as the meeting of the Parties to the Paris Agreement (CMA) maintains total authority over the Article 6.4 mechanism alongside the other implementation systems of the Paris Agreement. The CMA's mandate guidance significantly influences what approaches to users' rights would be considered appropriate and within the scope of delegated authority for the Supervisory Body and the secretariat.

The CMA has not given clear instructions about recognizing ownership in UNFCCC-administered registries which creates doubts about whether adopting an ownership-based framework could go beyond the existing delegated authority. The operational aspects of the mechanism receive primary attention in rules and modalities established through decision 3/CMA.3 instead of dealing with emission reduction legal characterization and ownership determination. The emphasis on operational aspects indicates that the mandated work focuses on implementation tasks instead of determining legal matters.

Further implementation of an ownership-based framework would need specific clarification from CMA regarding jurisdictional authorities and applicable laws together with liability frameworks. These fundamental legal questions would likely require Party-level agreement rather than implementation decisions by the Supervisory Body, given their significant implications for the mechanism's international legal character and the secretariat's institutional position.

The CMA mandate requirements indicate that using a control-based framework will help preserve established precedent better than other options. Implementation of the mechanism's operational aspects focuses on carrying out CMA-directed tasks while abstaining from making legal determinations that exceed implementation authority. If greater ownership certainty were deemed necessary, specific CMA guidance could be sought before fundamental changes to the registry's approach to users' rights.

13. CONCLUSION

13.1. Summary of Findings

A control-based framework with supplementary measures for ownership-dependent market functions proves superior to ownership-based approaches when implementing the Article 6.4 mechanism registry system. The analysis of multiple aspects during registry development and execution demonstrates this conclusion through extensive evaluation of legal aspects and operational factors and market requirements.

A control-based legal framework eliminates the major difficulties of identifying which laws and jurisdictions should determine ownership recognition within an international mechanism. The current institution faces difficulty in resolving these challenges which could potentially produce more legal confusion than clarity. The international treaty character of the registry along with its extranational nature creates substantial difficulties for determining ownership due to analysis with analogous systems.

The registry administrator benefits operationally from using a control-based framework because it enables sustainable administration of the registry system. The practical operational structure reduces organizational exposure to responsibility instead of requiring administrators to handle challenging legal determinations exceeding their institutional knowledge. Operational clarity produces a uniform application across multiple jurisdictions through a system that does not depend on deep legal understanding of various property laws.

The control-based framework delivers adequate functional certainty to markets which operate through proper documentation together with transparency and supporting measures. The operation of international carbon markets proves effective through existing registry systems when market participants establish separate mechanisms outside the registry framework for handling ownership questions.

13.2. Policy Implications

The results of this study generate various essential policy recommendations that affect the growth of Article 6.4 mechanism registries and extensive carbon market frameworks within the Paris Agreement. These findings create implications which surpass technical design aspects in order to examine essential institutional functions and market growth strategies as well as stakeholder expectations.

The Supervisory Body must proceed with implementing control-based framework development while adding complementary measures that support ownership-dependent market functionality. The registry must implement three main features which combine improved documentation systems with standardized reporting functionality and operational mechanisms to verify control status. The method creates a foundation that restricts registry authority appropriately while delivering practical operational assistance to market functions.

The public must receive education about the differences between market control of registry accounts and absolute property rights. The market requires understanding that registry accounts grant operational control instead of making complete legal ownership determinations thus necessitating separate agreements to demonstrate rights according to specific jurisdictional laws. A correct understanding of registry management serves both risk control purposes and market operational effectiveness.

The policy development process should analyze supplementary strategies which would improve market clarity without altering the core function of the registry. The framework contains possible additions such as example contracts for carbon trading alongside mandatory examination protocols and specialized educational programs about legal aspects of joining the carbon market. The proposed supplementary measures will tackle stakeholder market-related doubts while maintaining respect for the registry's current institutional framework.

13.3. Directions for Future Research

The analysis highlights multiple research opportunities to better understand control versus ownership schemes as they relate to carbon market growth. The identified research paths enable better understanding of market management through appropriate institutional frameworks for developing improved comprehensive operational approaches.

The implementation of security interests within control-based registry systems requires additional research to be conducted. A research study should investigate modern financing methods which allow ownership determination without requiring registry participation. Further analysis should explore functional methods to execute multi-party authorization specifications together with conditional transfer capabilities and technical security features which assist with establishing security arrangements.

Comparing how jurisdictions update their carbon credit legal structures makes up an essential area for future research. Legal approaches to carbon market instruments by different jurisdictions require increased focus on the relationship between their frameworks and international registry systems. The investigation would reveal developing best practices and possible harmonization possibilities to minimize friction between different jurisdictions.

Research focused on market participant experiences with various registry frameworks will provide essential data needed to improve ongoing registry system development.

The effects of various structural frameworks on transaction costs need to be combined with data on risk perception and market participation levels to improve registry components and additional market infrastructure. Research conducted in this area will enable the identification of particular weaknesses in existing systems as well as evaluation of possible solutions before implementing full-scale systems.

Research which merges legal with economic and technological viewpoints on registry development would create new systems that promote solutions beyond standard ownership and control boundaries. Advanced technologies including distributed ledger systems and smart contracts and digital identity verification systems present opportunities to improve existing issues in registry design and implementation. Technological advances have the potential to help create advanced user rights frameworks for upcoming registry systems provided they are properly matched to legal practices and institutional needs.

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