Economic Token Models in ReFi Projects: Token Design and Incentive Mechanisms Analysis

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Abstract: As cryptocurrency markets continue to captivate attention promising quick financial gains, it becomes increasingly important to critically examine blockchain-based projects that attract significant investments. This study provides insights into evaluating the viability of projects by analyzing and categorizing token attributes through the application of a token morphological framework. This serves as a structured examination of key parameters - purpose, governance, functional, and technical - to understand how different design aspects interact within each project and influence long-term success. We explore sustainability-oriented projects within the field of Regenerative Finance (ReFi) being a growing dimension of blockchain innovation that integrates financial systems with ecological and social regeneration. The focused approach of limiting the scope to three case studies ensures a deeper analysis and provides clarity in understanding the nuances of token design while also identifying possible patterns across projects. Hence, we define token archetypes offering valuable insights into how variations in token structure influence governance, user incentives, and economic viability, extending micro-level perspective to broader economic dynamics. This study sheds light on ownership and governance structures, token supply models, mechanisms for incentivizing participation while limiting and mitigating speculative behavior, and mechanisms for token removal from circulations. Understanding these aspects allow for shaping more impactful and resilient token economies and provides actionable insights that can inform future projects, making it relevant for both academic and practical implications. This comparative analysis contributes to the theoretical development of tokenomics by offering a clearer understanding of how different token structures align with organizational goals and community dynamics. In doing so, it bridges theoretical insights with practical applications.

1 INTRODUCTION

The facilitation of community ownership through the potential of decentralization, enabled by the emerging Web3 technology stack, is being continually explored by the business world (World Economic Forum, 2023). This shift of control, from centralized entities to the participants of the network, opens up ways for more transparent digital ecosystems. Hence, by leveraging blockchain technology the newly created markets allow people to connect, engage, and exchange value in ways that were previously difficult to imagine (Au & Power, 2018). Those disintermediated markets enable direct user interactions (peer-to-peer) through digital assets. Digital assets represent value such as cryptocurrencies, NFTs, and tokens providing utility or representing ownership (Deloitte, 2024). Those innovations give rise to Decentralized Finance (DeFi), simultaneously marking a transformative shift in the financial landscape (Piyankov, 2024).

The open nature and disintermediation of digital assets enable anyone to participate, fostering inclusivity. Moreover, the ability to fractionalize digital assets into smaller, transferable units, is another major advantage which fosters greater liquidity enabling more diverse participation in novel, tokenized economies (Davidson et al., 2018). This

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shift marks a significant departure from Web2, where reading and writing were prevailing functions, and data ownership was centralized. In the current Web3 landscape - also referred to as the Internet of Value (Ibrus & Rohn, 2023) – not only information, but economic assets can be easily transferred. The value is represented by tokens governed by economic laws, like supply and demand, leading to the emergence of tokenomics (Au & Power, 2018).

Integrating tokens into online experiences is how blockchain-based tokenomics reshapes value distribution in digital ecosystems (Bogdanov et al., 2024). The concept of tokenomics is not new. It can be traced way back to traditional economies using physical tokens in various forms, of which an example shall be of casino chips acting as tokens in a controlled economy, where their supply, value, and exchange rate are determined by the issuer - the casino itself. The economic model of a token encompasses its use, value, creation, distribution, supply and demand, as well as incentive mechanisms (Guan et al., 2024). Optimal tokenomics is project-specific and requires careful incentives design (or disincentives) aligning with the project's goals and encouraging desired behaviors (Olas, 2024), which directly influences user retention and further network growth. By leveraging cryptographic tools such as zero-knowledge proofs, alongside economic theories, tokenomics' aim is to design decentralized structures of incentive systems that actively encourage positive behaviors while minimizing risks of speculation or attacks – this shall ultimately align individual actions with the long term goals of the network (Freni et al., 2022). The concept of zero-knowledge proofs refers to one party proving to another party the validity of a statement without revealing any information beyond the truth of the statement itself (Blum et al., 1988), enabling for more efficient and secure transactions. To build ecosystems that are transparent, the field of tokenomics requires a rigorous and interdisciplinary approach - defining and automating mechanisms, such as staking, rewarding, and burning, through smart contracts which is to offer enforceability and avoid relying on external punishing measures (Cowen, 2018).

As the world approaches a deadline for the established UN SDGs, less than one fifth of the targets are on track (United Nations, 2024), which underscores the urgent need to focus on achieving reliable impact, as multiple reports from the European Commission, along various studies highlight the prevalence of misleading green claims. With many assertions found to be inaccurate (greenwashing), the research suggests that providing transparent, traceable, and tamper-proof data can significantly reduce this phenomenon (Silkoset, 2024). This leads to reimagining the business philosophy with the mutually reinforcing pursuit of profit complemented by sustainability (Polas et al., 2022). The world is falling behind on climate goals due to private and public opacity, inadequate accountability mechanisms, and limited transparency and interoperability of tracking systems, compounded by insufficient growth in climate finance (Hoopes IV et al., 2023). To achieve sustainability and broader social responsibility goals the business models that promote decentralization should be developed and the advancement of creating a circular value within products and services should take place (Upadhyay et al., 2021). However, there is a lack of meaningful discussion on how blockchain and Web3 technologies can contribute to the circular economy across dimensions of sustainable development (social, environmental, and economic) (Böckel et al., 2021). While technical frameworks have been extensively developed and explored, their broader business and societal impacts are still underexplored and not fully understood (Freni et al., 2022). Regenerative Finance (ReFi) which stands as a subset of DeFi, focuses on promoting the SDGs (Grasmann, 2024), facilitating funding flows, providing data-driven tools for deriving financial value from regenerative impact, and supporting new investment instruments backed by tokenized ecological assets. There are at least 500 active ReFi solutions currently in existence (Carbon Copy & ReFi DAO, 2024).

The research question of this study is: *How do token design choices shape economic dynamics in tokenized ecosystems?* By comparing three blockchain-based projects, this study explores how various elements of designing a token and token economy contribute to the long-term success of sustainability projects, identifying key lessons-learned and strategies that can be applied to other blockchain-based initiatives.

As tokens collectively represent the market value in hundreds of billions of dollars, the research in this domain is crucial for various groups - entrepreneurs, developers, and users - enhancing their prospects for achieving various economic goals (Hülsemann & Tumasjan, 2019). Organizations are rendered to assess specific needs addressed by digital assets as blockchain projects grow in number. They must also consider the involved parties, desired internal features and processes, as well as strategies for distribution and management, which requires rethinking structures and aligning both individual and collective incentives to create new efficiencies and opportunities (Lesavre et al., 2020). As blockchain technology introduces a

novel approach to coordinating economic activity, embedding key institutional elements of market capitalism: property rights, e.g. ledger entries and private keys, exchange mechanisms through public keys and P2P networks, native currency, i.e. crypto-tokens, legal frameworks through code is law, and financial systems, it stands of particular interest to institutional economists (Davidson et al., 2018). Valuable insights are being offered by the evolving economic structures and decentralized mechanisms of coordination through the emerging token economies as a foundation for a long-term coopetition in the digital age (Lamberty et al., 2023).

This study analyzes tokenomics through the design of tokens in three projects within the field of ReFi. Moreover, it bridges the design-oriented framework with the economic dynamics, showing how token systems can be evaluated both structurally and economically. The initial findings highlight diverse approaches to fostering engagement in ReFi ecosystems from focusing on the tangible action and behavioral change to the ones prioritizing system performance and strategic participation.

2 BACKGROUND

The focus of tokenomics is in defining and evaluating the economic characteristics of cryptographic tokens that represent a secure and provable digital form of a right that can serve multiple roles - value, stake, or voting rights within decentralized systems (Lamberty et al., 2023). The beginnings of tokenomics was through *utility tokens* enabling transactions and rewarding participants in decentralized apps (dApps), evolving over time to address the diverse needs of the expanding digital economy (Thomas, 2024). As highlighted earlier, cryptographic tokens represent diverse elements beyond mere financial speculation, serving as essential tools for decentralized coordination, governance, and optimization (Lamberty et al., 2023). As the field progressed it became significantly complex with the modern token design reflecting strategic nuances - some projects issuing separate tokens for the distinct purposes of *utility and governance* (providing a stake in the decision-making processes of a project), while others integrating both functions into a single token (Spaceseven, 2024). It is to be approached as an iterative process of open-ended choices, tested and refined over time, with the methods of implementation embedded within the designs themselves (Schneider, 2018).

Tokens most usually serve three key functions: incentivizing to join the platform *(Enter),* incentives to engage with the platform *(Stay and Play),* and incentives to remain long-term *(Captivate)* (Cyber Studio, 2017), highlighting the multifaceted nature of tokens within blockchain ecosystems. The long term success of such systems depends on designing well-structured tokenomics policies - while they cannot directly control token prices, strategies of token minting, supply adjustments, transaction fee changes, and modifying validator rewards can help achieve price equilibrium without compromising the system's overall viability or decentralization (Kiayias et al., 2024). Tokens must operate within a robust system of widely accepted norms, off-chain agreements, and on-chain technical rules in order to realize their potential, and only once such sociotechnical elements are integrated and accepted does the value creation in inter-organizational networks become possible (Sunyaev et al., 2021).

Nevertheless, beneath terms like tokenomics and blockchain technology, humans are simply trying to connect - communicate, produce, create, and exchange within a market (Au & Power, 2018). The lack of proper tokenomics and misaligned project models, however, contributed to major collapses, as seen with FTX and Terra, which extend beyond a single project, as risk spillover effects reached further into the crypto markets (Bouri et al., 2023). FTX's downfall was caused by unsustainable token models, and over-leveraging, with the incentive structures promoting risky and speculative behaviors (Conyers, 2024; Cryptoslav, 2022; Fang, 2023). However, this major collapse was not a failure of crypto itself, but of an organization marked by a centralized, irresponsible power and lack of transparency - a scenario already seen across various industries (World Economic Forum, 2023). The FTT token was artificially inflated (Ledoux & Smaili, 2024), which allowed for maintaining a false perception of success, though once the ecosystem collapsed, the lack of real value became obvious. Terra's failure, on the other hand, was caused by a flawed stablecoin model and weak governance, where short-term decisions (inflating supply) destabilized the system as LUNA and UST grew to a combined market cap of over $50 billion at their peak before collapse (Badev & Watsky, 2023). With these examples the poorly designed tokenomics exposes the possibility of the domino's effect highlighting the need for careful design to ensure transparency and accountability. The need to improve the balance, between attempts to damage the industry's reputation and the low rate of visible success, remains (Mougayar, 2024). The

potential for expanding services and goods is increased by a well-structured value, driving greater demand and contrasting the *'boom-collapse'* effect seen in most token issuances (Villares, 2022). Therefore, the detailed classification of token archetypes necessities in cross-referencing with broader economic dynamics to extend the examination of token systems' effectiveness. This is to achieve macro-level insights in addition to micro-level classification. Blueprint guidelines for a critical discussion of our study is contained within responsible tokenomics (Villares, 2022), of which questions can be grouped in themes of token: supply model, ownership and governance, participation and speculation prevention ([dis]incentives), lifecycle and adjustment mechanisms.

The potential of this rapidly evolving landscape is underscored by the economic potential of tokenization - BCG and ADDX project asset tokenization to reach $16 trillion by 2030 (Ledger Insights, 2022). The sustainable token design is a critical area of study in order to minimize the boom-and-bust cycles and by merging tokenomics with social impact not only new investment opportunities arise but also a groundbreaking approach to tackling the world's most urgent challenges occurs (Faster Capital, 2024).

3 METHODOLOGICAL FRAMEWORK

Although there exists a significant amount of research on cryptographic tokens concentrating on their role in driving incentive mechanisms (Schwiderowski et al., 2024), a deeper and structured analysis of their design, especially in ReFi projects, is lacking. This study adopts the approach which addresses the complexity of token classification and allows for defining token archetypes of each project by understanding specific parameters. We integrate a deductive approach by using a constructed morphological framework of token attributes (Oliveira et al., 2018), later supported with an inductive approach to gain more insights from the documentation analysis and further bridge micro and macro perspectives. This approach allows for the initial structured analysis, ensuring consistency and rigor in classification for three distinct cases, further enabling a comparative analysis across different contexts. However, the insights are of which token attributes interact within ecosystems, exposing differences in design and functionality, while ensuring the token design principles are being assessed within a practical set of real-world applications.

The discipline of tokenomics is multifaceted and requires expertise in various fields, from human behaviour, through rigorous modelling, to strategic thinking (Catena.MBA, 2024). Therefore, the design of effective tokenomics encompasses not only *incentive mechanisms* but also, often overlooked, dimensions of *market demands*, such as choosing the right business model (asset-backed tokens, crypto-backed tokens, stablecoins), and establishing *governance structures* through DAOs, community rights, safeguarding mechanisms against attacks - which as a whole can be defined into a broader concept of *'token dynamics'* (Binance Square, 2023). Accordingly, we explore key mechanisms in which specific designs operate and fulfil their roles for driving desirable impact. The study employs *secondary qualitative data analysis* (whitepapers, technical documentation, reports). However, where direct access to proprietary systems (private blockchains) is unavailable, interviews, public statements, or insights from project leaders are used. We acknowledge data availability inconsistencies in blockchain-based projects; therefore the study does not impose artificial uniformity but rather helps better visualize gaps and spot where transparency is lacking.

Table 1: Token Evaluation Criteria.

Token Attributes	Framework-based analysis.
Token Mechanism	Examination of token's operational structure (token execution and data anchoring in the ecosystem).
Token Distribution	Exploration of lock-up periods, allocation structure, fundraising mechanisms.

4 RESULTS

4.1 Token Parameters and Archetypes

4.1.1 Plastiks

Plastiks is a green tech company that uses blockchain ledger to verify and trace the recovery and recycling of plastic waste, converting these actions into *Plastic Credits* for environmental impact and support of the circular economy (Plastiks, 2024a). The effective waste management is necessary as the improved quality of life alongside the population growth drive industrialization resulting in the increased waste generation, hence converting plastic waste into value-added products is viewed as a key strategy for achieving a circular economy (Bhubalan et al., 2022).

Table 2: PLASTIK Token Parameters Classification.

Purpose Parameters:
Class: Utility Token **Function:** Work Token **Role:** Value Exchange, Reward
Governance Parameters:
Representation: Digital **Supply:** Pre-mined, one-off distribution **Incentive System:** Enter Platform, Use Platform, Stay Long-Term
Functional Parameters:
Spendability: Spendable **Tradability:** Tradable **Burnability:** Burnable **Expirability:** Non-Expirable **Fungibility:** Fungible
Technical Parameters:
Layer: Application (dApp) **Chain:** Issued on top of a protocol

The PLASTIK Token facilitates the creation and exchange of *Plastic Credits* (Plastiks, 2024a), tracks their sale and the release of funds for waste recovery efforts, reflecting the progress of the recovery process of plastic (Plastiks, 2024b). When a *Plastic Credit* is sold, 80% of the value is transferred to the *Entity* (responsible for waste recovery*)* in PLASTIK tokens, which are returned once all credits are sold - these funds (held in custody until the credits are sold) are then converted to USD, EUR, or USDT (stablecoin pegged to US dollar) (Plastiks, 2024b). Nozama Tech Ltd, the platform owner, retains 18% of the sale, while 2% is used to buy PLASTIK tokens from the market to reduce supply (Plastiks, 2024b). The smart contract is responsible for managing token balances. A total of 1,000,000,000 PLASTIK tokens have been issued (with no further issuance possible) of which Nozama Tech Ltd. controls 560,000,000 tokens, the management team and advisors hold 140,000,000 tokens, and 300,000,000 tokens are publicly traded (Plastiks, 2024b).

Tokens grant the right to access and participate in the plastic recovery process. Initially exchanged for plastic credits, when entering the platform's ecosystem, then tokens are used to track and fund plastic recovery projects. Connecting plastic credit sales with the release of funds serves as the long-term engagement incentives for plastic recovery initiatives by using them for transactions over time. The PLASTIK token is spendable as for tracking and managing plastic credit sales, as well as for the release of funds. It is also tradable on the open market, being a part of public blockchain *(Celo - a native layer where the smart contract operates, not relying on another layer or platform for its functionality)* and to be exchanged for stablecoin or fiat once the plastic recovery targets are achieved. They are partially burnable as the project aims to reduce the supply of tokens, through the market buy-back. The expiration function isn't described therefore the presumption of no such function is made as the long-term utility for the platform implies that the token is used continuously in the ecosystem.

Archetype: The PLASTIK Token falls under **Work Token** category rewarding entities involved in the process of plastic recovery.

4.1.2 Ocean Protocol

Satoshi Nakamoto envisioned blockchain as a scalable system capable of handling an unlimited range of data applications, originally designing Bitcoin with the vision of supporting a global data economy (Louw, 2022). So far, the progress of the data economy has been slow, largely overlooked, and remaining highly centralized - controlled by a few major tech conglomerates (Namdev, 2023).

Table 3: OCEAN Token Parameters Classification.

Purpose Parameters:
Class: Utility Token **Function:** Hybrid *(Usage and Work Token)* **Role:** Currency, Earnings, Reward, Right
Governance Parameters:
Representation: Digital **Supply:** Pre-mined, scheduled distribution **Incentive System:** Enter Platform, Use Platform, Stay Long-Term
Functional Parameters:
Spendability: Spendable **Tradability:** Tradable **Burnability:** Burnable **Expirability:** Non-Expirable **Fungibility:** Fungible
Technical Parameters:
Layer: Protocol (Non-Native) **Chain:** Issued on top of a protocol

Tokens are locked, being the utility tokens, which means that they cannot be traded before the network launch; otherwise, they would be classified as securities (Pon, 2018). The OCEAN token primarily functions as a *Usage Token*, granting access to the decentralized data marketplace, enabling data transactions, and interacting with DeFi protocols, acting like an 'access card' (Oliveira et al., 2018). It

also has *Work Token* characteristics, incentivizing (and reward) participants, such as data providers, for sharing resources or securing the network. Thus, OCEAN serves a hybrid role, allowing both usage for platform access and rewards for contributions. Not only does it function as a medium of exchange for data and services within the Ocean Protocol ecosystem, but also plays a role in Earnings (rewarding data providers). However, the Currency plays a dominant role. It represents access, data ownership, and rights within the digital ecosystem of the Ocean Protocol, with no direct connection to physical or legal assets (Oliveira et al., 2018). The project has a maximum token supply of 1.41 billion OCEAN, with a circulating supply of 224,375,091 and a total supply of 974,807,052 (as of November 2024) (CoinGecko, 2024). The raise of funds occurs through a public pre-launch token distribution for whitelisted participants, indicating the prioritization of a transparent and fair approach while avoiding speculative bonuses. To ensure long-term stability the project applies extended lock-up and vesting periods in place (Pon, 2018). Contributor tokens are allocated 25–50%, subject to lock-up periods across three phases—*Seed, Pre-Launch, and Network Launch*—following a schedule-based supply model (Pon, 2018). By implementing fixed hard caps for each phase and distribution schedules, the project encourages long-term commitment from participants. To ensure that early-stage investors cannot sell off large amounts of tokens immediately, the lock-up and vesting periods are tied to each phase promoting a stable token economy along with incentivizing ongoing engagement with the project. It is essential to recognize that although such structured model of distribution offers a more controlled growth while mitigating speculative behaviors, it does not create long-term value. It is project's ability to generate real utility and demand to ensure value.

As a matter of token allocation, a fifth of the total OCEAN supply is dedicated to the project's founders, 5% to the protocol foundation, and 15% to SAFT purchasers, with the remaining tokens distributed to Ocean network nodes (Kriptomat, 2021). A SAFT (Simple Agreement for Future Tokens) essentially grants investors the right to receive functional utility tokens once the network is live (shall not be confused with SAFE) though its regulatory status is still unclear (Batiz-Benet et al., 2017). Additionally, OCEAN is deflationary, as 5% of all network revenue is burned, which means the token supply will decrease at an accelerating rate as adoption of the Ocean Protocol grows (Kriptomat, 2021). Tokens cannot be spent during the lock-up phase, but become spendable post-network launch, aligning with their utility role (Pon, 2018). Bridging the gap between data industry and DeFi requires data tokens (ERC-20 tokens) - stored in crypto wallets, traded on exchanges, transferred to decentralized autonomous organizations (DAOs), and used for various other DeFi activities (Kriptomat, 2021). The protocol of the project is built on top of the Ethereum Ecosystem: Polygon, Optimism, Energi, Polkadot, Sora (CoinGecko, 2024).

Archetype: The OCEAN Token falls under **Funding Token** category, incorporating also elements of **Work Token (**data contributions) and **Asset Token** (representing ownership or control over a share of the assets within the protocol).

4.1.3 Toucan Protocol

The ReFi community has faced criticism for prioritizing digital engagement over tangible climate impact, making it crucial for the industry to focus on real, verifiable emissions reductions and regenerative practices (Hoopes IV et al., 2023). Differences between various projects and their specific characteristics make carbon credits often hard to buy or sell quickly causing this asset class to be less liquid (Toucan Protocol, 2024c). Currently, the trade of verifiable carbon credits is limited by economies of scale, as offsets are typically traded in bulk on the voluntary carbon market; however, a public ledger allows carbon offsets to be linked to individual products on a microscale (WEF et al., 2018).

Table 4: TCO2 Token Parameters Classification.

Purpose Parameters:
Class: Utility Token **Function:** Asset-Based Token **Role:** Value Exchange
Governance Parameters:
Representation: Digital **Supply:** Schedule-based **Incentive System:** Use Platform and Stay Long-Term
Functional Parameters:
Spendability: Spendable **Tradability:** Tradable **Burnability:** Burnable **Expirability:** Non-Expirable **Fungibility:** Fungible
Technical Parameters:
Layer: Protocol (Non-Native) **Chain:** Issued on top of a protocol

Toucan does not issue carbon credits, but rather provides infrastructure for tokenizing existing credits from the Voluntary Carbon Market (VCM) in which carbon credits are classified as commodities rather than securities, meaning that in tokenized market, they are treated as utility tokens (Toucan, 2022). The platform is pioneering real-world asset (RWA) tokenization, having brought $100 million worth of carbon credits on-chain and facilitated $4 billion in transactional volume, since its establishment in 2021 (Toucan Protocol, 2024a). Key products of the project include the *Puro Carbon Bridge,* which allows to tokenize carbon removal credits (CORCs) with *TCO2 Tokens* representing one ton of carbon avoided or removed (tokenized carbon credits tied to specific environmental projects). In order to convert CORCs into TCO2 tokens (via the Puro Carbon Bridge) users first provide required details (CORCs serial number, the project name, the wallet address), then the credits are locked in account within the Puro Registry, ensuring that the physical credits cannot be double-used (Puro Earth Registry, 2024). A Batch NFT is then created as an on-chain asset containing detailed information about the tokenization process and is fractionalized into TCO2 tokens (each representing one CORC) - these tokens are delivered to the specified wallet for use in on-chain carbon markets. The Batch NFT is a unique representation of a carbon credits' collection, where the fractionalized TCO2 tokens are fungible and allow for more accessible participation in the carbon credit market. This system ensures that each TCO2 token directly corresponds to verified carbon removal (Toucan Protocol, 2024e).

Other products are *Carbon Pools* which bundle TCO2 tokens (Toucan Protocol, 2024a). This process of tokens commoditization (grouping similar credits together), with the use of *carbon reference tokens NCT and BCT*, enables the creation of a standardized product that can be traded on decentralized exchanges (DEXs), offering greater liquidity than individual project credits (Toucan Protocol, 2024b). BCT and NCT tokens are backed by real-world carbon credits that have been tokenized through the Toucan Protocol's bridging process (simply, backed by TCO2 tokens). Additionally, the *Green NFT Extension* tool enables embedding carbon removal credits in ERC-721 collections, while the dApp facilitates actions of depositing, redeeming, and retiring tokenized carbon credits (Toucan Protocol, 2024a), broadening the usability of tokenized credits.

The token supply depends on the issuance of new carbon credits from verified environmental projects. TCO2 token is issued on top of the *Regen Network* - a public blockchain built with the Cosmos SDK (Polygon Labs, 2023). Tokens are spendable - to be used for carbon offset transactions and potentially other green initiatives, and tradable in the market for carbon credits. To ensure that the credits cannot be reintroduced or reused the retiring process occurs (permanent removal akin to burning) which functions as their complete elimination from the ecosystem in a way that guarantees no further transactions or claims can be made on those credits (Toucan Protocol, 2024d). There is not inherent expiration date indicated as tied to the token.

Archetype: The TCO2 Token best fits into the **Asset Token** category, however without the purpose of a voting right - which might be rather seen in tokenized security tokens (European Securities and Markets Authority, 2024).

5 DISCUSSION

We position our analysis with a complementary blueprint of responsible tokenomics drawing on Villares' (Villares, 2022) contributions, which focus on the broader economic considerations and provide valuable context for our examination. From the ***ownership and governance*** perspective, only OCEAN token grants the right to participate in the governance process of the protocol, though the significant portion is allocated to Ocean Protocol Foundation. Users of Plastiks might influence the development of the ecosystem, but governance is largely centralized around *Nozama Tech Ltd* which controls a significant amount of the supply. The governance over the Toucan protocol, however, is largely off-chain and handled by the protocol developers. Hence, the future of these projects heavily depends on the balance of power between centralized entities and the broader community. Furthermore, another interesting and varying aspect observed in the analysis reliant upon the project's goals are ***supply models***. The PLASTIK token has a fixed, pre-mined supply of 1 billion tokens, characterized by one-off distribution - the total token supply is capped at issuance. The OCEAN token supply has a maximum cap of 1.41B tokens which are released gradually over time according to a predefined schedule, distributing tokens for staking rewards, liquidity mining (Nexera, 2021), and participation in the ecosystem's growth. For TCO2 tokens the supply is schedule-based as certain events occur - the issuance of tokenized carbon credits, and no maximum supply cap stated upfront. Each model impacts future supply control, inflation risk, and adaptability in different ways. PLASTIK's supply

ensures no inflation but it could potentially lead to more speculative behaviors in pump-and-dump schemes. OCEAN's gradual release on the other hand allows for continuous incentives and ecosystem growth. Long-term inflation risks are lowered as the scheduled distribution allows for better predictions though possible illiquidity remains. TCO2's schedule-based supply model comes with risks of dependency on external factors and supply constraints. Furthermore, the ***participation and prevention of speculative behaviors*** can be viewed from the incentive context. In case of Plastiks the model is action-based and transactional, aimed at rewarding environmentally positive activities, where the aforementioned fixed supply can be viewed as a mechanism of preventing inflation and the redeemed tokens serve as creating a more transparent and verifiable system. Earning OCEAN tokens happens by engaging in activities of staking, data sharing, or participating in governance decisions (voting on key proposals) and the supply cap shall mitigate the speculation risks. Toucan project's rewards stem from tokenizing carbon credits and participating in carbon trading, where speculation risks are minimized by the underlying real-world value of carbon credits, which ensures the value of the TCO2 token. Lastly, the aspect of ***removing tokens from circulation*** attracts some questions. Currently, there are no suggestions of large numbers of PLASTIK tokens having been lost or burnt, though the returns on tokens indicate their permanent removal once specific goals are achieved. OCEAN tokens on the other hand might be locked or staked for long-term incentives and TCO2 tokens' exact number burnt is tied to offset activities rather than speculative activity.

The analysis of different projects demonstrates that there is no one-size-fits-all approach. While Toucan Protocol exposes how standardization and liquidity provision make tokenized assets appealing for environmental markets, Ocean Protocol showcases how data sharing and monetization can be strategically incentivized. Direct incentives, however, that effectively drive consumer and corporate engagement are illustrated in Plastiks case. It is worth bearing in mind that even well-designed incentives can lead to unintended consequences if the project lacks strong governance as presented in the cases provided in the Background section. Each project demonstrates that robust structures i.e. hybrid as seen in Ocean Protocol, allow to enhance trust as well as align user actions with the project's mission.

6 CONCLUSION

Much of the current discourse in tokenomics revolves around supply, demand, and incentive mechanisms. While leveraging multiple token-based incentives can enhance various aspects, such as transaction volume and strategic engagement (Ballandies, 2022), a narrow focus on incentives overlooks critical factors like value creation, governance, and business logic (Binance Square, 2023). Some projects employ multi-layered token systems, incorporating NFTs and multiple token roles which facilitates different ecosystem functions. Similarly in other cases, a single token may serve diverse purposes. Therefore, tokenomics research requires a more holistic approach – it necessitates a broader analytical approach that considers the full spectrum of token interactions and their systemic impact.

The limitations of this study are in the number of projects examined as well as the less structured approach to the analysis of token dynamics elements. While the comparison of PLASTIK, OCEAN, and TCO2 tokens, reveals the diverse ways tokens can serve utility, governance, and asset ownership roles, demonstrating the importance of aligning tokenomics design with the objectives of each project, *Phase 2* of this study would employ a more complex and holistic framework such as Token System Configurator (Schubert et al., 2021). This offers even more detailed modelling of the economic dynamics and decision-making processes, allowing to focus more on the interactions between tokens and their ecosystems. Furthermore, insights from a quantitative data analysis would be valuable to enhance the study with *token performance*, e.g. through market trends, token price fluctuations, and on-chain activity, *user engagement*, e.g. through participation rates, transaction volumes, and staking behaviours, as well as *detailed token distribution*, staking metrics, and reward issuance analysis to assess the efficiency and effectiveness of token systems design.

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