io.net

The Incentive Dynamic Engine (IDE): Building a sustainable token economy for io.net

1. Introduction

This litepaper lays out the new tokenomic model for io.net driven by a unique double model for building a healthy, sustainable Decentralized Physical Infrastructure (DePIN) Network known as the Incentive Dynamic Engine (IDE). We released a previous version of this paper in December 2025 for a period of community review and feedback. Since that time, we have instituted a number of suggestions, but the bulk of the paper remains unchanged. We see this as a testament to the strength of the initial proposal, and the need in the market for truly utility driven tokenomics.

2. Context: The challenges of the DePIN market

Over the past two years, Decentralized Physical Infrastructure Networks (DePINs) have surged in prominence. They promise an internet where compute, storage, bandwidth, tooling and AI inference and models are contributed not by hyperscalers, but by global communities of independent operators.

Yet, behind this decentralized dream lies a recurring economic fragility: volatile incentives. Most networks bootstrap supply by issuing tokens at a fixed rate, rewarding early adopters through inflationary emissions. This works, until the market turns. When token prices fall, operators exit. As supply contracts, network utility declines, creating a reflexive collapse. And when token prices unexpectedly rise based on speculation, people rush to the market and can flood networks with short-term, unsustainable supply

3. The current situation: From inflationary growth to sustainable economics

In the early stages of io.net's growth, the network's success relied on a supply-driven tokenomic model. Inflationary rewards were used to attract GPU providers to the network, ensuring that sufficient computational capacity existed to meet emerging user demand. This model was instrumental in bootstrapping io.net's ecosystem, enabling rapid expansion and establishing a robust network of decentralized compute providers with tens of thousands of suppliers across 138 countries.

What began as an effective mechanism for growth carried inherent long-term challenges. Fixed token emissions created constant inflationary pressure, gradually diluting the value of the $IO token. These incentives threatened to outstrip the value created by the utility of the token, thereby damaging the long term health of the network. GPU providers, whose earnings were directly tied to the volatile token price, faced unpredictable income and high exposure to market fluctuations. During periods of stress or downturn, this model risked a “negative spiral”: as token prices fell, suppliers would leave, reducing network capacity and further depressing demand and token value.

It had become clear that a new approach was needed as we moved into 2026. The next phase of io.net’s economic evolution demanded a framework capable of ensuring stability for suppliers, the ability to attract high quality suppliers, sustainability for the network, and lasting value for token holders. The first step was Total Network Earnings (TNE) which put all of the network’s revenue on chain, along with buy-backs to add further utility to the token. This was an important step, but it was clear further action was needed, this led to the development of the Incentive Dynamic Engine (IDE).
The IDE introduces a demand-driven economic control system that transitions io.net from an inflationary to a self-regulating, sustainable model.

Currently, there are 300M $IO tokens in emissions supply, minus what was already emitted, for the old incentive model. One goal of the IDE is to burn at least 50% of these over time to ensure a healthy, sustainable network.

4. The problem: Volatility, inflation, and fragile incentives

Under the legacy system, io.net’s token economy was primarily supply-driven in order to bootstrap the project. A fixed emission schedule distributed new tokens on a predictable timeline. While this made modeling straightforward, it also disconnected token emission from real network activity. The result was a mismatch between supply and actual economic utility

Suppliers were rewarded in tokens that fluctuated in value against the U.S. dollar, creating uncertain returns. The system’s lack of counter-cyclical safeguards meant that during downturns, supplier income fell precisely when it was needed most. Without a mechanism to stabilize returns, suppliers’ profitability hinged entirely on token price performance and usage, leaving the network exposed to the vicious feedback loop of falling prices, supplier exits, and shrinking utility.

This environment made it increasingly difficult to align stakeholders. GPU providers sought predictable earnings, while investors prioritized deflationary token supply and price appreciation. The absence of a stabilizing economic layer meant that these interests were often in tension rather than working in harmony.

5. The Solution: The Incentive Dynamic Engine

The Incentive Dynamic Engine (IDE) represents a fundamental reimagining of io.net's economic architecture. Rather than relying on fixed emissions, IDE introduces a dynamic control system that continuously adjusts token release and payout levels in response to real network conditions. This is a demand driven model, where real utility is at the center

Unlike many projects that rely on hype and speculation, the IDE is a demand-driven model. The token's value comes from actual usage from people paying to use GPU computing power. The more the network gets used, the healthier the economics become. It's designed around real utility, not just memes, speculation,
or the simple hope the token price goes up.

To further ensure the health of the network, there will also be a burn mechanism that drives value for the token. After GPU suppliers get paid, at least 50% of the remaining revenue in the form of $IO tokens gets permanently burned (destroyed), decreasing inflationary pressure. The more the network is used, the more tokens get burned creating natural scarcity based on real demand.

At the heart of the IDE is an intelligent system with two separate vaults that work together to maintain more stable supplier rewards through economic upturns and downturns. Together, these vaults form the heart of io.net's counter-cyclical tokenomics.
When network revenue exceeds payout obligations, the system absorbs tokens from circulation, creating deflationary pressure. When revenue falls short, IDE temporarily taps into reserves to ensure stable USD-equivalent rewards. This adaptive mechanism allows the network to handle changes in market cycles, balancing growth and stability through design rather than reaction.

The IDE mitigates the risk to GPU suppliers through stable, USD-denominated rewards, independent of token market volatility. Each hour, the protocol calculates a total payout target that represents the aggregate income due to all suppliers. The system then determines how many $IO tokens must be distributed to meet this payout at the current market price.

A technical explanation of how the IDE works can be found in the appendix, along with a link to a full 3rd party report from CEL.

6. Why It Matters: Economic resilience and stakeholder alignment

The IDE model marks a profound shift in how io.net balances the interests of its core participants.

For GPU providers, the IDE removes one of the greatest barriers to long-term participation: income volatility. Suppliers can now rely on predictable, USD-targeted payouts regardless of token price movements, ensuring steady returns even during broader market downturns.

Users benefit from a more resilient compute network. Because supplier participation is no longer tied to token speculation, the network remains operational and responsive even during market volatility. This consistent supply of GPU power ensures reliability for enterprise and developer clients, reinforcing io.net's value proposition as a dependable decentralized compute provider.

Ultimately, IDE aligns all stakeholders around a single unifying goal: maintaining economic equilibrium. The health of the network can be measured through a metric called the sustainability ratio (a full explanation can be found in the appendix), providing a transparent, real-time indicator of stability and long-term viability.

7. What sets the IDE apart: A new model for DePIN

While many projects in the DePIN and distributed compute ecosystem rely on token incentives to bootstrap supply, io.net's Incentive Dynamic Engine stands apart as a fully adaptive, demand-responsive tokenomic system.

Most projects use fixed or semi-fixed emission models, where token rewards are distributed regardless of network utilization. This approach can successfully attract early contributors but often leads to highly inflationary token supplies, which naturally put pressure on token value, and can eventually lead to supplier attrition. Some networks attempt to counter this with aggressive token burns or fee redistributions, but these mechanisms are typically reactive and lack true economic feedback control.

The IDE, by contrast, operates as a self-regulating macroeconomic system. It continuously measures the relationship between network revenue and payout obligations through the sustainability ratio and automatically adjusts token emission and burns in real time. This means io.net's economy can respond to demand shocks, price volatility, or usage surges without external intervention or governance lag

Unlike other DePIN projects, io.net also decouples supplier income from token speculation, providing stable USD-based earnings that attract professional, long-term infrastructure providers rather than opportunistic miners or hobbyists. This creates a more dependable compute layer capable of supporting enterprise-grade workloads, while maintaining token scarcity and deflationary discipline for investors.

In essence, IDE transforms io.net's economy from a simple reward-distribution model into an autonomous economic engine, capable of maintaining equilibrium across multiple market regimes. This design not only differentiates io.net within the decentralized compute sector but sets a new standard for how token economies can achieve stability, scalability, and sustainability simultaneously.

Looking beyond other DePIN networks, the IDE allows io.net to position itself as a true alternative to the centralized compute networks that currently dominate the networking landscape. Devs, Startup founders, scale ups, and enterprises are looking to build on strong, stable, and sustainable networks. The success of their projects depend on it. The speculative nature of most tokenomics has been a factor in keeping many mainstream builders away from DePIN. By shifting the model from speculation to utility the IDE provides the security and peace-of-mind that projects need to feel comfortable making the switch to decentralized infrastructure.

Decentralized compute networks address a number of challenges faced by growing companies including, cost, accessibility, security, censorship resistance, and resilience. DePIN networks remove the need for centralized players, which helps counteract monopolistic pricing, but also removes single points of failure. If a data center goes down, even temporarily, as has happened numerous times with AWS, Google, and Microsoft, it can cause massive disruption to services. But with decentralized networks, traffic can be rerouted and new instances spun up almost instantly.

By making decentralized compute networks a viable option for everyone from startups to established companies, io.net is also laying the groundwork for a new era of open, democratized AI. One of the greatest challenges for current AI development is the cost of compute resources and access to high powered GPUs. When these barriers are removed through a truly sustainable decentralized network, AI moves from being something available for the few to something that can enable the many, opening the possibility for robust AI development in markets around the world.

8. Governance: Risks and safeguards

While the IDE represents a major step forward in tokenomic design, it is not a "set-and-forget" system. Its strength lies in its ability to adapt dynamically, but this adaptability depends on continuous monitoring and technical governance. This paper itself is part of that process.

The core health of the system will be measured through four key indicators: the sustainability ratio, the reserve runway, the Reward Vault balance, and total token burn volume. Maintaining a healthy sustainability ratio ensures that the network's revenues cover its obligations, which provides a buffer to suppliers against unexpected downturns.

Nevertheless, risks remain. One such risk is that in order to attract high-quality, long-term partners and suppliers they will receive stable USD-equivalent income. This could lead suppliers to become detached from the long-term value of the $IO token, but this is viewed as a calculated risk needed to protect them from potential market downturns.

Vault drift introduces an additional consideration. If emissions are set too low relative to fee inflows, reserves may gradually decrease over time even under normal operating conditions. However, this can be accounted for by periodically adjusting emission rates, burn parameters, and fee structures based on ongoing KPI monitoring.

Through these mechanisms, the IDE transforms tokenomics management into a dynamic, data-driven governance process, ensuring resilience through constant oversight.

9. Looking Ahead: A token economy for the agentic era

The architecture of the Incentive Dynamic Engine is not just a solution for internal stability, it also lays the groundwork for a new agentic economy. By linking real economic activity (GPU usage) with programmable finance, io.net opens the door to a fair and transparent AI economy.

io.net's launch of Agent Cloud is a significant step in this direction. Agent Cloud allows Agents to buy, deploy and manage their own infrastructure resources without any human intervention. By combining this with the IDE, we are building a framework for a transparent agent compute and inference exchange platform.

In this vision, io.net evolves beyond a decentralized compute provider and becomes its own self-sustaining, on-chain economy, seamlessly integrating real-world utility for humans and agents.

10. Conclusion: The economics of stability

The Incentive Dynamic Engine represents a milestone in io.net's journey toward sustainable growth. By transitioning from a supply-driven, inflationary model to a dynamic, demand-driven framework, IDE redefines what is possible for decentralized token economies.

Its genius lies in its simplicity. A single metric, the sustainability ratio, captures the economic heartbeat of the entire network. As long as the sustainability ratio remains around one, the system sustains itself without inflation, ensuring fair rewards for suppliers and enduring value for token holders.

In a volatile industry where most networks are defined by speculative cycles, io.net's IDE stands out as a model of economic resilience and design-driven sustainability. It demonstrates that stability can be engineered not through central control but through adaptive, transparent, and algorithmic governance.

With the IDE, io.net is not merely adjusting its tokenomics, it is pioneering a new paradigm for decentralized economic systems, one where growth, stability, and long-term value are no longer in conflict but in harmony.

The IDE will be fully implemented in Q2 2026.

Appendix

How the IDE works

The IDE operates through a two-tier vault structure. The first tier, the Reward Vault (Y_1), is funded by emissions and acts as the network's primary reserve. When network revenue is sufficient, new emissions are stored here as surplus; when it falls short, Y_1 provides the buffer needed to maintain supplier stability. The second tier, the Fee Vault (Y_2), is funded by client payments in USD. This vault serves as the secondary reserve, used only when Y_1 alone cannot meet payout requirements.

Together, these vaults form the heart of io.net's counter-cyclical tokenomics. When network revenue exceeds payout obligations, captured by the sustainability ratio $\psi = R/H$, the system absorbs tokens from circulation, creating deflationary pressure. When revenue falls short, IDE temporarily expands supply to ensure stable USD-equivalent rewards. This adaptive mechanism allows the network to breathe with market cycles, balancing growth and stability through design rather than reaction.

At a technical level, the IDE functions as a programmable economic controller, dynamically balancing supply and demand for tokens. Its logic can be summarized in three key steps.

First, the system computes the hourly payout target $H = N(ROI + Z)^{*}$, where N represents the number of active GPUs, ROI is the target return on investment per supplier, and Z covers operational costs.

Second, it determines the sustainability ratio $\psi = R/H$, where R represents protocol revenue derived from user fees. This ratio instantly classifies the network's economic state as either a surplus ($\psi > 1$), equilibrium ($\psi = 1$), or deficit ($\psi < 1$).

Third, the IDE adjusts token supply accordingly. When $\psi > 1$, the protocol absorbs tokens via burns and vault accumulation, reducing circulating supply. When $\psi < 1$, it temporarily issues new tokens from the Reward Vault to maintain payout stability.

In simulations conducted by CryptoEcon Lab, the IDE proved robust across multiple stress scenarios. When demand fell by 55%, supplier ROI remained stable, as the IDE drew from reserves to prevent income disruption. During a simulated 50% token price crash, the IDE automatically compensated by issuing additional tokens while maintaining consistent USD payouts. These results validated IDE's design as a true economic stabilizer capable of preserving network integrity even amid extreme volatility. The full CryptoEcon Lab report can be found on the tokenomics landing page on io.net.