Tokenomic White Paper

PHY Token Economic Model

Executive Summary

The PHY token serves as the native utility and governance token of the DePHY network, a decentralized physical infrastructure network designed for DePIN. With a total supply of 1 billion PHY tokens, the economic model ensures sustainable growth through carefully designed mining mechanisms, token distribution, and governance structures.

Token Overview

- **Token Name**: DePHY Token
- **Token Ticker**: PHY
- **Total Supply**: 1,000,000,000 PHY
- **Token Type**: Utility Token
- **Initial Daily Mining Budget**: 400,000 PHY

Token Distribution

Allocation Breakdown

Category	Allocation	Amount (PHY)	Purpose
Mining	35%	350,000,000	Network security and decentralization through miner and node operator participation
Team	20%	200,000,000	Ensuring adequate funding support for core members during initial development and long-term maintenance, incentivizing continuous innovation and ecosystem growth

Ecosystem & Partners	22%	220,000,000	Comprehensive ecosystem development and partnership support
	Ecosystem Development 7%	70,000,000	Supporting startups, developers, and technical contributors within the project ecosystem to promote prosperity
	Marketing 5%	50,000,000	Expanding DePHY's market influence and attracting more users and partners
	Testnet 5%	50,000,000	Providing resource support for functional verification, performance optimization, and developer participation during testing phase
	Reserve 5%	50,000,000	Providing long-term funding support and enhancing project risk resistance
Fundraising	18%	180,000,000	Supporting early project development and operations through private and public offerings
Advisors	5%	50,000,000	Introducing industry experts to provide professional guidance for strategic decisions, technical development, market promotion, and Solana ecosystem support

Mining Mechanism

Mining Formula

DePHY employs a sophisticated mining calculation system that rewards both hardware investment (DID ownership) and token staking:

For Staking with DID Binding:

$$V = (I + 1.5 \times S) \times uptime\_percentage$$

Where:

- **I (Investment Coefficient)** = 5 × 299 / Token Price
- **S (Staking Amount)** $\in$ [0, 20,000]
- **uptime_percentage** $\in$ [0, 1]

Special Case - DID with third party hardwares(custom node):

If DID has no official node (purely NFT):

- **I** = 5 × 199 / Token Price

For Pure Token Staking (No DID):

$$V = 0.2 \times S$$

Where $S \in [0, +\infty)$

Reward Distribution:

$$\text{Individual Reward} = V / \Sigma(V) \times daily\_budget$$

Where:

- **V**: Total mining coefficient for a specific miner
- **Σ(V)**: Sum of all V values (including DID-bound and pure token staking)
- **daily_budget**: Total tokens released per day

Mining Emission Schedule

The mining rewards follow a 30% reduction every 6 months:

Period	Duration	Daily Budget (PHY)	Period Total (PHY)	Cumulative (PHY)
1	First 6 months	400,000	72,000,000	72,000,000

2	Second 6 months	280,000	50,400,000	122,400,000
3	Third 6 months	196,000	35,280,000	157,680,000
4	Fourth 6 months	137,200	24,696,000	182,376,000
5	Fifth 6 months	96,040	17,287,200	199,663,200
6	Sixth 6 months	67,228	12,101,040	211,764,240
7+	Subsequent periods	Continue 30% reduction	...	...

Dynamic Reward Characteristics

1. **Market-Based Adjustment**

   - Investment coefficient (I) inversely correlates with token price

   - Lower token prices increase base rewards, stabilizing the network

   - Higher token prices naturally reduce inflation

   - Token price adjustment is not real-time; it's only adjusted during significant market fluctuations to maintain stable and predictable mining efficiency

2. **Service Contribution Weighting**

   - Staking value (S) receives 1.5x multiplier with DID

   - Encourages both hardware investment and token staking

   - Pure token staking receives only 0.2x multiplier

3. **Uptime Incentive**

   - Rewards scale linearly with node uptime

   - Encourages reliable infrastructure provision

   - Penalizes unreliable nodes naturally

Token Utility

Primary Functions

1. **Mining Participation**

   - Stake PHY to increase mining rewards

   - Maximum staking benefit: 20,000 PHY per DID

   - Unlimited staking for pure token mining (at reduced efficiency)

2. **Network Fees**

   - Transaction execution fees

   - Smart contract deployment and execution

   - API access and premium services

3. **Resource Incentives**

   - Facilitate resource exchange between ecosystem partners

   - Reward infrastructure providers

   - Enable decentralized service marketplace

4. **Governance**

   - Proposal creation and voting

   - Parameter adjustments

   - Treasury management decisions

Economic Sustainability

Value Accrual Mechanisms

1. **Network Effect**

   - More miners → Better infrastructure coverage

   - Better coverage → More users

   - More users → Higher token demand

2. **Staking Lock-up**

   - Reduces circulating supply

   - Creates buying pressure

- Aligns long-term incentives

3. **Dynamic Pricing**

   - Mining rewards adjust with market conditions

   - Self-balancing mechanism prevents oversupply

   - Maintains network security during price volatility

Fee Structure

- **Transaction Fees**: Paid in PHY for all network operations

- **Service Fees**: Premium features require PHY payment

- **Governance Fees**: Proposal creation requires PHY stake

Staking Economics

Staking Benefits by Type

Staking Type	Multiplier	Max Effective Amount	Additional Benefits
With DID & Node	1.5x	20,000 PHY	Full mining rewards
With DID (Self-deployed Software Node)	1.5x	20,000 PHY	Full mining capacity
Pure Token	0.2x	Unlimited	Passive income only

Investment Coefficient Dynamics

The investment coefficient (I) creates an anti-cyclical mechanism:

- **Bear Market**: I increases as token price decreases

- **Bull Market**: I decreases as token price increases

- **Result**: Stable USD-denominated rewards for miners

Governance Model

Governance Structure

1. **Proposal Types**

   - Technical upgrades

   - Economic parameter adjustments

   - Treasury allocations

   - Partnership approvals

2. **Voting Power**

   - Based on PHY holdings

   - Additional weight for long-term stakers

   - DID holders receive governance multipliers

3. **Implementation**

   - On-chain voting for transparency

   - Time-locked execution for security

   - Emergency procedures for critical updates

Conclusion

The PHY token economic model creates a sustainable ecosystem that:

- Rewards both hardware investment and token staking

- Maintains network security through balanced incentives

- Adapts to market conditions automatically

- Ensures long-term value alignment

Through the innovative combination of DID-based mining and dynamic reward adjustments, DePHY positions itself as a leader in the DePIN space, creating real value through decentralized infrastructure.