Kaiko

Supply & Market cap

Methodology one-pager

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www. kaiko.com

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Executive Summary

Kaiko provides institutional-grade supply and market capitalization data for digital assets through direct on-chain collection. Our methodology eliminates reliance on self-declared figures by querying blockchain networks directly, ensuring accurate and transparent market metrics updated in real-time.

Core Definitions

Total Supply

The cumulative number of tokens that have been issued on-chain as of the current time. This includes all tokens, whether circulating, locked, or held in protocol-controlled addresses.

Calculation: Retrieved directly from the token's smart contract or native blockchain state.

Circulating Supply

The number of tokens that are freely tradable and available in the market. This excludes:

- **Locked tokens: V**esting contracts, timelocks, escrows.
- **Protocol-controlled addresses:** Foundation treasuries, team allocations, DAO multisigs.
- **Burnt tokens:** Tokens sent to dead addresses or burn mechanisms.
- **Lost tokens:** Provably inaccessible addresses where applicable.

Calculation: Total Supply minus all non-circulating token balances identified through on-chain analysis.

Market Capitalization

```
Market Cap = Circulating Supply × Current Price
```

Current Price Methodology: The current price is derived from Kaiko's cross-exchange synthetic price.

This product aggregates trade data across multiple exchanges to produce a volume-weighted, manipulation-resistant reference price. This methodology ensures that market capitalization reflects fair market value rather than prices from single venues that may be subject to illiquidity or manipulation.

More documentation here:
https://docs.kaiko.com/explore-our-data/data-dictionary/analytics-solutions/kaiko-fair-market-value/established-assets

Data Collection Methodology

Infrastructure

Full archive nodes for major blockchain networks (Arbitrum, Avalanche, Base, Bob, BSC, Celo, Ethereum, Optimism, Polygon, Bitcoin, Solana, Linea, HyperEVM, and more) to ensure direct, unmediated access to on-chain data.

Collection Process

1. Total Supply Retrieval

1. Query smart contract totalSupply() function (EVM chains).
2. Query blockchain state endpoints (native tokens: SOL, FIL, XRP, etc.)
3. Monitor emission schedules and minting events in real-time.

2. Non-Circulating Address Identification For each asset, we maintain a continuously updated list of non-circulating addresses:

- **Vesting contracts**: Tokens locked with time-based release schedules.
- **Timelocks**: Smart contracts restricting token movement until specific dates.
- **Protocol treasuries**: Foundation, team, and DAO-controlled wallets.
- **Burn addresses**: `0x0000...dead`, `0x0000...0000`, and protocol-specific burn mechanisms.
- **Bridge exploits**: Addresses holding tokens from verified security incidents.
- **Staking contracts**: Where staked tokens are non-transferable (case-by-case assessment).

3. Balance Aggregation

- Query balances of all identified non-circulating addresses.
- Sum total non-circulating holdings.
- Calculate circulating supply: `Total Supply - Non-Circulating Holdings`

4. Data Validation

- Cross-reference with token allocation documentation.
- Monitoring for contract upgrades and governance changes.
- Validate against on-chain transaction patterns.
- Validate against third party sources.

Update Frequency

- **Total Supply:** Collected every 5 minutes.
- **Circulating Supply:** Collected every 5 minutes.
- **Market Cap:** Computed every 5 minutes.

This granularity enables:

- Intraday index rebalancing.
- High-frequency dominance metrics (BTC.D, ETH.D)
- Sub-daily market cap trend analysis.
- Higher time-frame aggregations based on many datapoints instead of one measure.

Why On-Chain Verification

The Problem with Self-Declaration

The mainstream market cap providers primarily rely on **self-reported supply figures** provided by project foundations via APIs or manual submissions. This introduces several critical issues:

1. Misaligned Incentives Projects have commercial incentives to present favorable metrics:

- **Understating circulating supply** → Artificially inflated price with lower perceived supply.
- **Overstating circulating supply** → Higher market cap ranking and perceived liquidity.
- **Inconsistent treatment** → Selective classification of locked vs. circulating tokens.

2. Methodological Opacity Self-declared endpoints (e.g., Optimism's `circulatingSupply.txt`, Arbitrum Foundation API) provide no transparency regarding:

- Which addresses are excluded and why.
- Update frequency or data freshness.
- Historical methodology changes.

3. Empirical Discrepancies Our analysis reveals significant variances:

- **HYPE:** The two mainstream market cap providers report figures that differ by 38%.
- **XRP:** Both providers use Ripple Foundation's API with undisclosed methodology.
- **ONDO:** Foundation API conflicts with on-chain reality by material amounts.
- **PENDLE:** Official endpoint excludes 60M vePENDLE tokens we classify as circulating.

4. Static Data Limitations Most providers update supply data once daily, insufficient for:

- Real-time index construction.
- Intraday risk management.
- High-frequency trading strategies.

Kaiko's Solution

Our on-chain methodology provides:

- **Consistency:** Uniform treatment of similar lock mechanisms across all assets.
- **Real-time accuracy:** 5-minute refresh captures emissions, burns, and unlocks as they occur.
- **Independence:** No reliance on project cooperation or incentive alignment.

Asset-Specific Variations

While our core methodology remains consistent, certain assets require specialized approaches:

- **Multi-chain tokens** (USDC, USDT): Aggregate supply across all deployed chains.
- **Native L1/L2 tokens** (SOL, FIL, XRP): Utilize blockchain-specific state queries.
- **Privacy coins** (XMR): Employ algorithmic emission formulas where on-chain supply is obfuscated.

Disclaimers

Methodology Discrepancies

Kaiko's circulating supply figures may differ materially from other data providers due to our on-chain verification approach. Specifically:

- We **do not** rely on project self-declarations.
- We **apply** consistent standards for classifying locked tokens.
- We **exclude** vesting contracts identified through on-chain analysis, which may differ from project announcements.

Users should be aware: Kaiko market cap values may not match figures displayed on popular aggregator websites. This reflects our commitment to verifiable data over industry convention.

Classification Limitations

Circulating supply classification requires subjective judgment in certain cases:

- **Lost coins** (e.g., Bitcoin): Conservative approach excludes only provably inaccessible addresses.
- **Governance-locked tokens**: Classification depends on unlock mechanism transparency.

Data Completeness

For assets for which the methodology cannot apply:

- Utilize project-provided APIs (with clear indication).
- Derive supply from public RPC endpoints.
- Exclude the asset if reliable on-chain data is unavailable.

Real-Time Accuracy

While we update supply data every 5 minutes, on-chain events (emissions, burns, unlocks) may create brief inconsistencies.

Use Cases

Kaiko's supply data enables institutional-grade applications:

- **Index Construction**: Rebalance portfolios based on real-time market cap weights.
- **Dominance Metrics**: Calculate BTC.D, ETH.D, and stablecoin dominance intraday.
- **Risk Management**: Monitor dilution events and unlock schedules.
- **Regulatory Reporting**: Auditable, blockchain-verified market metrics.
- **Quantitative Research**: Historical supply analysis at granular intervals.

Data Access

Supply and market capitalization data are available via:

- **Kaiko API**: Real-time and historical supply endpoints.
- **Custom Solutions**: Dedicated implementations for specific institutional requirements.

Governance and Updates

Our methodology is subject to continuous review:

- **Quarterly Reviews**: Assessment of new lock mechanisms and protocol upgrades.
- 24/7 support thanks to our operations teams based in NYC, Paris, Singapore.