

Truflation Bitcoin Purchasing Power Index (TruBPPI)

Methodology

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1. Executive Summary

The Truflation Bitcoin Purchasing Power Index (TruBPPI) is a real time benchmark designed to measure Bitcoin's purchasing power relative to a diversified basket of globally significant commodities. This index is important because it reframes Bitcoin's value in real economic terms, rather than purely in nominal price movements.

Traditional measures evaluate Bitcoin against fiat currencies, which themselves are subject to inflation, policy decisions and changing purchasing power. The Truflation Bitcoin Purchasing Power Index (TruBPPI) addresses this limitation by measuring Bitcoin against a basket of essential commodities; energy, food, metals, and technology, critical resources that underpin economic activity. This allows users to assess whether Bitcoin is gaining or losing real purchasing power, independent of fiat currency debasement.

By using real time, commodity based benchmarks, the TruBPPI provides:

- A clearer lens on Bitcoin's effectiveness as a store of value.
- A way to compare Bitcoin's performance against hard assets that reflect global supply and demand dynamics
- Greater transparency for investors, institutions, and policymakers evaluating Bitcoin's long term economic relevance

In essence, the TruBPPI shifts the conversation from "What is Bitcoin worth in dollars?" to "What can Bitcoin actually buy?", making it a more meaningful measure of value in an inflationary and increasingly commodity-constrained global economy.

2. Truflation Bitcoin Purchasing Power Index Framework

The Truflation Bitcoin Purchasing Power Index (TruBPPI) is a transparent, decentralized, and market reflective benchmark designed to evaluate Bitcoin's evolving role in the global economy. It provides investors, analysts, and DeFi protocols with an accurate, real world measure of Bitcoin's purchasing power over time.

The steps undertaken to create the index are as follows:

Step 1: Commodities Used

The Index incorporates a diversified set of commodities spanning multiple sectors of the global economy. This breadth ensures a comprehensive and balanced view of Bitcoin's purchasing power relative to the real assets that underpin global production, consumption, and technological development. The commodities included in the index are outlined below in Exhibit 1.

Exhibit 1 – Commodities Included in the TruBPPI

Energy Commodities	Crude Oil Futures	Metals Commodities	Aluminium Futures
	Coal Futures		Iron Futures (Fines 62% FE CFR)
	Natural Gas Futures		Copper Futures
Agricultural Commodities	Corn Futures		Uranium Futures
	Wheat Futures		Lithium Carbonate Futures
	Soybean Futures	Precious Metal Commodities	Gold Futures
	Feeder Cattle Futures		Silver Futures
	Live Cattle Futures		Platinum Futures

The selection of commodities for this index is based on their significance in global markets and their relevance to industries most affected by Bitcoin and broader cryptocurrency movements. The index encompasses major energy sources such as oil and gas, essential agricultural commodities, industrial and technological metals and precious metals commonly used for both investment and industrial purposes.

Step 2: Data Collection

Primary commodity price data for the Truflation Bitcoin Purchasing Power Index is sourced from leading global exchanges, including the New York Mercantile Exchange (NYMEX), the Intercontinental Exchange (ICE), Commodity Exchange, Inc. (COMEX), Guangzhou Futures Exchange (GFEX), Chicago Mercantile Exchange (CME), and the Chicago Board of Trade (CBOT). These exchanges provide high quality, exchange traded futures prices that reflect transparent and liquid global markets.

The daily index value is calculated using an arithmetic average of futures prices obtained from the multiple data providers listed above. This approach strengthens data robustness by mitigating source specific anomalies, minimizing the influence of outliers and delivering a balanced representation of prevailing market conditions.

In instances where a daily price is unavailable from one data source, the index calculation relies on prices reported by the remaining sources for the relevant commodity on that day. This approach ensures continuity in index calculation, maintains methodological consistency and minimizes the risk of data gaps.

Data sourced from exchanges undergo a rigorous validation and quality control process, with prices and index values systematically cross verified across multiple sources to ensure consistency, accuracy and reliability. Data sources are continuously monitored to maintain an uninterrupted, up to date flow of information and any anomalies, discrepancies or irregularities are promptly investigated and corrected. Regular updates are incorporated into the index calculation to ensure the index accurately reflects current market conditions.

Step 3: Weighting Scheme

Each commodity's weighting is designed to reflect its relative importance within the global economy. Commodities with higher weightings, such as crude oil, play a central role in global energy markets and exert a substantial influence on overall economic conditions. Agricultural commodities, including soybeans, corn, and wheat, represent vital components of the global food supply. Industrial metals like copper and aluminum are fundamental to manufacturing and infrastructure development, while precious metals such as gold, silver, and platinum serve dual roles as industrial inputs and investment assets.

The inclusion of newly added commodities, Lithium Carbonate and Uranium, highlights the growing importance of sustainable energy resources and advanced technology materials in the evolving global economy.

This balanced and comprehensive approach ensures that the Truflation Bitcoin Purchasing Power Index provides a robust and meaningful measure of Bitcoin's value relative to a diversified basket of globally significant commodities.

The methodology is modeled on the World Bank's *Commodity Price Data (Pink Sheet)* framework, with targeted adaptations to incorporate emerging commodities that reflect current economic and technological trends.

Basis for Weightings

The foundational weights are derived from the World Bank's Pink Sheet methodology, which accounts for trade volumes, economic significance, and prevailing market dynamics of individual commodities. This approach offers a well-established and widely recognized framework for assessing the relative

importance of commodities within the global economy and serves as a robust baseline for the index.

Inclusion of New Commodities

To ensure relevance in the context of evolving energy systems and technological advancement, the index incorporates two additional commodities: Lithium Carbonate and Uranium.

- Lithium Carbonate is included to capture the rapid growth of electric vehicles and high-technology industries, reflecting its critical role in battery production and energy storage solutions.
- Uranium is added to represent the increasing global emphasis on nuclear energy as a reliable, low-carbon power source. As countries invest in nuclear infrastructure to enhance energy security and support decarbonization goals, uranium has emerged as a strategically important commodity.

Adjustments and Rebalancing

The inclusion of Lithium Carbonate and Uranium required adjustments to the original weighting structure to ensure the total index weighting remains at 100 percent. The weights of existing commodities were proportionally scaled to accommodate these additions while preserving the integrity and balance of the overall index.

The final weightings, see exhibit 2, are intended to reflect each commodity's current relevance and impact within global markets, ensuring the index remains a reliable benchmark for assessing Bitcoin's purchasing power. Regular evaluations of market conditions, economic data, and structural trends are conducted to keep the index aligned with evolving global realities.

Exhibit 2 – TruBPPI Weighting

Commodity	Classification	Weight
Crude Oil Futures	Energy	48.0%
Coal Futures	Energy	3.0%
Natural Gas Futures	Energy	7.0%
Soybean Futures	Agricultural	4.0%
Corn Futures	Agricultural	6.0%
Wheat Futures	Agricultural	6.0%
Feeder Cattle Futures	Agricultural	1.5%
Live Cattle Futures	Agricultural	1.5%
Aluminum Futures	Metals	4.0%
Iron ore fines 62% Fe CFR Futures	Metals	4.0%
Copper Futures	Metals	4.0%

Uranium	Metals	4.0%
Lithium Carbonate Futures	Metals	3.0%
Gold Futures	Precious Metals	3.0%
Silver Futures	Precious Metals	0.6%
Platinum Futures	Precious Metals	0.4%

Step 4: Calculation

The index calculation methodology is designed to accurately capture changes in the prices of the selected commodities and measure their value relative to Bitcoin. This section outlines the procedures, assumptions, and formulas used to compute the Truflation Bitcoin Purchasing Power Index (BPPI).

The first step is to establish the base date which serves as the foundational reference point for the Truflation Bitcoin Purchasing Power Index and is essential for calculating the dollar value of the commodities basket relative to Bitcoin. 2011 has been selected as the base period to ensure the availability of consistent and comprehensive historical data across all included commodities.

- *Base Date Selection:* The official base date of the index is January 1, 2011. This date marks the starting point from which changes in the dollar value of the commodities basket are measured. The year 2011 represents a pivotal period in global economic and technological development, coinciding with the early growth of Bitcoin and the increasing importance of advanced technologies and renewable energy resources, key themes reflected in the index composition.
- *Base Date Calculation:*
 - *Commodity Pricing:* On the base date, the price of each commodity included in the index is recorded using its respective futures price, where applicable.
 - *Weight Application:* Each commodity price is multiplied by its assigned index weight. For example, if Brent Crude Oil futures are priced at \$X on the base date and carry a weight of 48.0%, their contribution to the index equals $\$X \times 0.48$.
 - *Dollar Value of the Basket:* The weighted values of all commodities are summed to determine the total dollar value of the commodities basket on the base date. This figure serves as the benchmark for measuring subsequent changes in the basket's value.

As a result the Truflation Bitcoin Purchasing Power Index formula is:

$$\text{TruBPPI}(t) = [\text{Basket Value in USD at time } t] / [\text{Price of 1 BTC in USD at time } t]$$

Step 5: Rebalancing Frequency

The Truflation Bitcoin Purchasing Power Index is rebalanced annually on June 1st, ensuring that the index continues to accurately reflect evolving market conditions while maintaining methodological stability.

Prior to each rebalancing, a comprehensive market analysis is performed, incorporating statistical models to identify emerging trends, structural shifts, and changing market dynamics. These include:

- Adjustments based on traditional metrics such as market relevance and trading activity, but also with consideration given to price volatility.
- Global economic and technology developments to systematically assess their impact on commodity markets. For example, the growing emphasis on renewable energy and electrification may increase the relevance of specific commodities within the index. Weightings are adjusted accordingly to ensure the index remains forward looking and aligned with macroeconomic and technological shifts.

Before implementing any rebalancing changes, simulations and backtesting are conducted using historical data to evaluate the potential impact of proposed adjustments under various market scenarios. These analyses inform final weighting decisions and help optimize index performance and resilience.

Following each rebalancing cycle, the index's performance is reviewed to identify opportunities for methodological enhancement. The rebalancing framework remains adaptable, allowing for refinements based on new insights, market developments and technological advancements.

All changes made during the rebalancing process are fully documented and communicated in a transparent manner. A detailed post rebalancing report is published, outlining the rationale for each adjustment and its expected impact on index composition and performance. Links to our annual post rebalancing reports are published in the appendix below.

Step 6: Scaling Factor (Divisor Adjustment)

A scaling factor is applied to maintain index continuity and prevent artificial changes in the index level resulting from structural events. Structural events include constituent additions or deletions, changes in index weights due to scheduled rebalancing and other methodology driven adjustments.

The scaling factor is calculated as:

$$\text{Scaling Factor} = \text{Old Weighted Sum} / \text{New Weighted Sum}$$

The index level is calculated as:

$$\text{Index Level} = \text{Weighted Sum} \times \text{Scaling Factor}$$

Prior to a structural event, the scaling factor remains unchanged. On the effective date of a constituent change or weight rebalance, the scaling factor is recalculated so that the index level immediately before and after the event remains consistent. The recalculated scaling factor remains in effect until the next structural event requiring adjustment.

All scaling factor changes are documented with effective dates to ensure transparency, auditability, and historical consistency of the index series.

3. The Output Metrics

The Truflation Bitcoin Purchasing Power Index will be updated on a daily basis and produces the following indexes:

1. TruBPPI Headline Index
2. Daily Headline year on year percentage change
3. Each of the constituents index
4. Each of the constituents year on year percentage change
5. Historical time series

The TruBPPI Index was launched on June 6, 2025, with historical data available from 2011.

In addition to the main TruBPPI Index, the index has four sub-indexes that have been created to provide deeper insight into market dynamics, which include:

- TruBPPI Metals
- TruBPPI Energy
- TruBPPI Agriculture
- TruBPPI Precious Metals

Each sub-index isolates specific segments of the broader Bitcoin market to highlight trends and performance patterns: for example, the Metals sub-index tracks price dynamics of key industrial and precious metals, while the Energy, Agriculture, and Precious Metals sub-indexes capture market behavior in their respective sectors. These sub-indexes allow investors and analysts to assess trends and performance beyond the aggregated Truflation Bitcoin Purchasing Power Index, providing a more granular view of sector-specific market movements.

The data is published daily on the Truflation dashboard, where users can access historical records and download the full datasets.

4. Compliance and Governance

The compliance and governance framework of the Truflation Bitcoin Purchasing Power Index defines the controls and oversight mechanisms designed to support integrity, transparency and methodological rigor in the construction and maintenance of the benchmark.

The TruBPPI methodology is designed to align with internationally recognized standards for financial benchmarks, including the IOSCO Principles for Financial Benchmarks, which address areas such as data sufficiency, transparency, accountability, and auditability.

In particular, the methodology incorporates IOSCO consistent controls across (i) administrator responsibility and documented calculation procedures, (ii) use of exchange based, observable input data with validation and cross verification, (iii) periodic review through scheduled rebalancing and documented methodology updates, and (iv) accountability through record-keeping, monitoring, and stakeholder feedback mechanisms.

The methodology document clearly identifies all data sources used in the index calculation, providing transparency to users and stakeholders. Any changes to data sources resulting from market developments or improvements in data availability are communicated in a timely and transparent manner. The data collection process adheres to international standards and best practices for financial benchmarks, with data confidentiality and integrity maintained throughout all stages of collection and processing.

By leveraging a combination of direct exchange data and aggregated information from trusted data providers, the Bitcoin Purchasing Power Index delivers a comprehensive, accurate and reliable representation of market conditions. This diversified data sourcing approach supports the robust construction and ongoing maintenance of the index, fostering confidence among users and stakeholders.

Stakeholder engagement is a central element of the index governance process. Users are encouraged to provide feedback, which is carefully reviewed by the

oversight committee to enhance the index's relevance and ensure it continues to meet user needs.

Through the implementation of rigorous compliance and governance procedures, the index maintains the highest standards of quality and integrity, fostering trust among users and supporting the effective functioning of the Bitcoin Purchasing Power Index.

5. Truflation Bitcoin Purchasing Power Index Benefits

The Truflation Bitcoin Purchasing Power Index offers several key benefits for investors, analysts, and other stakeholders seeking a deeper understanding of Bitcoin's economic role and broader market trends. Key benefits include:

- ***Real Time Insight into Bitcoin's Purchasing Power:*** Tracks how Bitcoin's value changes relative to key commodities, providing a clearer picture of its true economic utility beyond price fluctuations in USD or other fiat currencies. Helps users assess whether Bitcoin is gaining or losing real world purchasing power over time.
- ***Sector and Market Segmentation:*** Offers subindexes (e.g., Metals, Energy, Agriculture, Precious Metals) to highlight trends within specific sectors. Enables analysis of market dynamics beyond the overall Bitcoin market, identifying sector specific performance patterns.
- ***Diversification and Broad Commodity Coverage:*** Includes a diverse array of commodities, ensuring the index is not overly reliant on the price movements of a single asset.
- ***Benchmarking and Market Analysis:*** Provides a standardized measure to track Bitcoin's performance over time. Serves as a benchmark for evaluating investments, hedging strategies, and broader market trends.
- ***Data Driven Transparency:*** Leverages multiple data sources, including direct exchange data and aggregated market information. Employs rigorous validation, cross verification, and quality controls to ensure reliability and accuracy and enhances transparency for investors, researchers, and regulators.
- ***Supports Informed Decision Making:*** Equips investors, policymakers and analysts with a reliable measure of Bitcoin's real world value. Highlights macroeconomic trends in cryptocurrency markets that may not be evident from price data alone.

6. Summary

The Truflation Bitcoin Purchasing Power Index (TruBPPI) is designed to provide a transparent, rules based and economically meaningful benchmark for assessing Bitcoin's value relative to the real assets that underpin the global economy. The methodology ensures consistency, continuity, and institutional integrity over time and by combining real time exchange data with systematic oversight, the TruBPPI delivers a reliable and forward looking framework for evaluating Bitcoin's purchasing power. As markets, technologies, and economic structures evolve, the index is built to adapt thoughtfully while preserving methodological stability, ensuring it remains a credible and relevant reference point for investors, institutions and policymakers.

7. Version History

Version	Date Released	Notes
1.0	June 6, 2025	Genesis of the Truflation Bitcoin Purchasing Power Index

8. Annual Post Rebalancing Reports

Year	Date Released	Links
2026	June 1,, 2026	