

Bitcoin Standard Hashrate Token

Alex Zhao

alex@1-b.tc

November 11, 2020

Abstract. A significant impediment to participation in Bitcoin mining is the limited number of exit options. Bitcoin Standard Hashrate Token (“BTCST”) solves this problem by bringing exchange-grade liquidity to Bitcoin mining. Each BTCST is collateralized by 0.1 terahash per second (“TH/s”) of Bitcoin mining power. By staking BTCSTs, holders of the tokens will receive daily Bitcoin distributions that correspond to the mining power staked. And because the market price of BTCST is determinable as the discounted cashflow of the underlying mining power, BTCST in secondary trading will perform as a leveraged Bitcoin token free from liquidation risk. BTCST will create an efficient market for Bitcoin’s mining power in ways similar to how Grayscale Bitcoin Trust creates institutional liquidity for Bitcoin.

1 Introduction

Bitcoin mining is a profitable venture with limited liquidity. Most miners must choose between holding onto equipment for years or relying on brokers for infrequent sales. This lack of liquidity means Bitcoin miners have few ways to hedge against or profit from the price fluctuation of mining machines. The same also discourages newcomers from seriously participating in Bitcoin mining. Finally, while traders often have the interest to gain Bitcoin mining exposure for it can be viewed as Bitcoin long options, high transaction costs dissuade them.

A market needs to be made.

Cloud mining is an imperfect solution. While cloud mining lowers the barrier of entry to mining, lack of standardization and strong product coupling make markets hard to form around mining contracts.

We propose to solve this problem through Bitcoin Standard Hashrate Token (“BTCST”), a token collateralized by standardized Bitcoin mining power. By standardizing and tokenizing mining power into BTCST and listing the token for

exchange trading, we can bring exchange-grade liquidity to the mining power market while meeting traders' need for mining exposure.

2 Exchange trading of Bitcoin mining power

Each BTCST is a token collateralized by a standardized unit of actual Bitcoin mining power. Holding the token is legally and functionally equivalent to owning the underlying mining power; staking the token on-chain will entitle the staking holder to receive mining rewards in Bitcoin; and listing of BTCST on major exchanges will bring meaningful liquidity to tokenized Bitcoin mining power.

BTCST creates an efficient market among Bitcoin miners and those interested in becoming one. By trading BTCST, market participants can freely enter and exit Bitcoin mining exposure in any size, at any time, and with low costs. Even miners without mining power tokenized by BTCST can make use of the token to capture the profits in or hedge against the risks of mining machine price fluctuation.

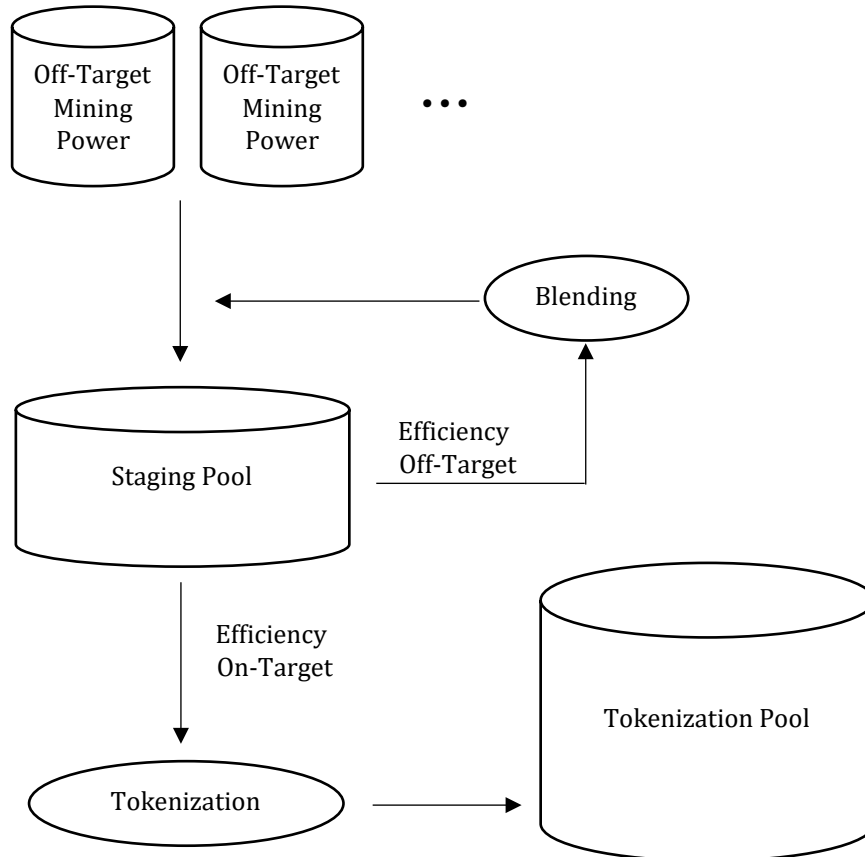
BTCST also connects miners with traders in general. Because the market price of BTCST will perform as a leveraged Bitcoin token, BTCST will meet a variety of trading needs of proprietary and algorithmic traders in ways that are previously unattainable.

3 Issuance — freely participable Bitcoin mining power standardization and tokenization

BTCST will, and can only be issued, when actual Bitcoin mining power has been contributed to or acquired by the project. Under the contribution program, a miner decides to contribute eligible mining power to the project in exchange for newly issued BTCSTs. Because BTCST issuance is freely participable, any miner may contribute mining power to apply for standardization and tokenization as long as the miner can demonstrate that (i) the contributed mining power is owned free and clear, (ii) equipment generating the mining power is hosted in sites that have passed the program team's risk assessment, and (iii) no fewer than 5 PH/s of mining power are contributed.

Under the acquisition program, the project acquires eligible Bitcoin mining power in the open market with raised capital or retained earnings. BTCSTs issued under the acquisition program will be owned by the project itself. Under either the contribution or the acquisition program, the number of units of TH/s that the

contributed or acquired Bitcoin mining power can be standardized into will be at least equal to the number of newly issued BTCSTs.



The standardization target of BTCST is 60 W/TH upon launch. Specifically, when eligible units of mining power are either contributed or acquired, they will be placed in a staging pool awaiting standardization. If the effective efficiency of all staged mining power is not 60 W/TH, the project will seek additional mining power with suitable efficiency to be either contributed or acquired so that the effective efficiency of the resultant blend of all staged mining power will reach target.

For example, if the staging pool has a total of 10 PH/s mining power with an off-target effective efficiency of 75 W/TH, the project may choose to procure another 10 PH/s mining power with an effective efficiency of 45 W/TH to bring the overall effective efficiency of the staging pool to target.

When blending succeeds for a staging pool, the project will, with the consent of owners of staged mining power, move all staged units of mining power to the

project's tokenization pool and issue one BTCST for each 0.1 standardized unit of TH/s added to the tokenization pool. When blending fails, there will be no ownership transfer of the staged mining power and no token issuance.

By operation of token design, the total circulation of BTCST must at least generate the amount of mining power that all circulating tokens collectively represent. For example, if the blockchain shows 10,000 BTCSTs in circulation, the project must generate at least 1000 TH/s in Bitcoin mining power. As discussed below, a mining pool will partner with the project as an independent auditor and periodically publish reports to demonstrate mining reward sufficiency and to prove that BTCST is fully or over collateralized by mining power.

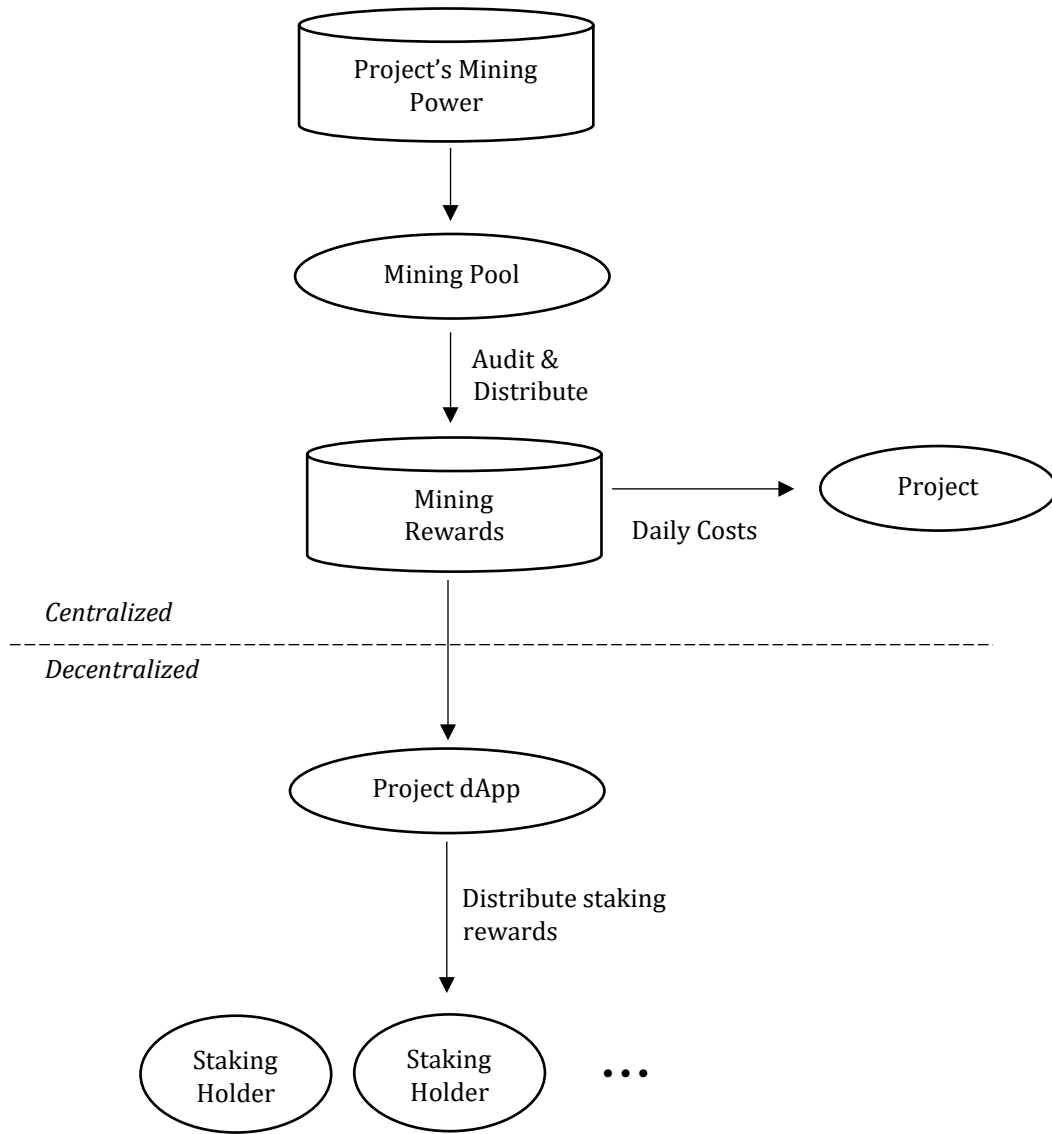
4 Stake-to-Mine

BTCST claims mining rewards from the Bitcoin network centrally and distributes rewards to holders de-centrally. The project will partner with a reputable mining pool to claim mining rewards from the Bitcoin network. Namely, the project will direct all mining power collateralizing the token to the partnering mining pool in exchange for daily mining rewards as calculated and allocated by the pool. Centralization of this step is necessary to ensure feasibility and accountability: the mining pool will act as both a service provider and as an auditor that monitors mining power sufficiency. As it is customary, the project expects up to 10% of annual mining power downtime.

Once daily mining rewards arrive, a portion will be sold on the open market to cover the project's daily energy and operational costs. The formula for determining the project's daily costs, with the industry-standard power usage efficiency loss set at 3%, is

$$\begin{array}{rcl}
 \text{Total Daily Costs (USD)} & = & 0.06 \text{ kW / TH} \quad \textit{times} \\
 & & \text{Mining Power (TH)} \quad \textit{times} \\
 & & 24 \text{ (h)} \quad \textit{times} \\
 & & \text{Energy Cost (USD/kWh)} \quad \textit{times} \\
 & & 1.03
 \end{array}$$

Energy cost is currently at USD 0.058 / kWh. The execution price and amount of the daily sale will be audited and published by the project, as verifiable by the mining pool. Remaining mining rewards attributable to mining power representatively staked in the project's DeFi yield farming dApp will be sent by the project and the mining pool jointly to the dApp and pooled there.



Holders stake BTCSTs in the dApp to yield farm Bitcoin. Namely, every BTCST staked continuously for a day (Singapore time) will increase the amount of Bitcoin that a staking holder is entitled to withdraw from the dApp by an amount equal to Bitcoin minable by 0.1 terahash of mining power on that specific day.

Namely, a holder of BTCSTs stakes 10 BTCST in the project dApp for a full day on day 1 (Singapore time). On day 2, the staking holder will be entitled to withdraw Bitcoin, as wrapped by the applicable blockchain, in an amount minable by one terahash of mining power on day 1. As with direct mining, the precise amount of

Bitcoin minable by one terahash of mining power will vary daily as a result of changing network hashrate, difficulty, and Bitcoin price relative to energy costs.

The amount of Bitcoin the staking holder is entitled to withdraw will increase and accumulate in the dApp for each continuous day (Singapore time) of staking. Calculation and allocation of Bitcoin rewards are performed transparently by the dApp. The staking holder may withdraw mined Bitcoin at any time. The dApp supports both partial and complete withdrawals of Bitcoin rewards.

The example below explains mining rewards distribution in further details:

	Day 1 0.5 BTC	Day 2 0.6 BTC	Day 3 0.8 BTC	Day 4 0.9 BTC	Day 5 0.6 BTC
User A Staked BTCST	+100				
User B Staked BTCST	+200		-100, +100		
User A Daily Share	0%	33%	50%	33%	33%
User B Daily Share	0%	67%	50%	67%	67%
User A Mined BTC	0.00	0.00	0.20	0.60	0.90
User B Mined BTC	0.00	0.00	0.40	0.80	1.10

5 Liquidity premium protection

We expect the price of BTCST to command a liquidity premium as compared to mining power without tokenization. To protect this premium against undue sell pressure, material issuances of BTCSTs must be approved by the project's governance board.

The project may freely issue on any given day BTCSTs representing up to 5 PH/s of mining power. For a daily issuance of BTCSTs representing more than 5 PH/s, the issuance must be unanimously approved by the project's governance board, which includes a seat occupied by the partnering mining pool.

In addition, and similar to how Grayscale Bitcoin Trust operates, newly issued BTCSTs are subject to a 25-week lock period. BTCSTs issued to the project itself are subject to the same lock period. The release schedule for locked tokens is linear and weekly. For example, if 1000 locked BTCSTs are issued and locked on January 1, forty BTCSTs will be released from lock on January 8 and every week thereafter until the 175th day after January 1.

Locked BTCSTs can be staked in the dApp and generate mining rewards for their owners. During staking, linear release continues to run as usual and the unique release schedule of each locked BTCST follows the token as it is staked into or un-staked from the dApp. The last-in-first-out method determines which BTCSTs are returned to a staking holder upon un-staking for the purpose of determining remaining release schedules.

6 As a leveraged Bitcoin token; Market-Making

Each BTCST is collateralized by real mining power. Therefore, its fair market value can be determined by the discounted cashflow model. The price of BTCST in secondary trading should track that of Bitcoin and the token should be able to function as a leveraged Bitcoin token in an efficient market. Further, because BTCST does not depend upon financial derivatives, it is by design free from liquidation risk.

The project team will serve as BTCST's main market-maker. Unlike tokens the intrinsic values of which are hard to ascertain, BTCST has not only an intuitive valuation model as but also an over-the-counter market for the underlying assets. The project team therefore has clear methodologies and incentives to bring the market price of BTCST towards equilibrium.

7 Risk Disclosure and Risk Management

While Bitcoin mining has traditionally been profitable when viewed as a whole, the profitability of individual miners, including this project, is far less certain. Risks inherent in Bitcoin mining are equally applicable to this project because mining power is the base collateral. Tokenization introduces additional risks.

Specifically, mining rewards on BTCST may temporarily or permanently stop if, among other risks, (i) properties generating our mining power experience damages or losses (including those resulting from floods, landslides, earthquakes, heavy rainfalls, and tornados), (ii) we are unable to enforce our contractual rights (particularly those in place to control our energy costs), (iii) Bitcoin network-wide hashrate increases to a level where our standard unit of mining power becomes profitless, and (iv) mistakes in the project's dApp cause errors or enable attacks, leading to the loss or inaccessibility of mining rewards.

To manage these risks, the program team will, among other things, (i) select historically stable sites (across China, Canada and Kazakhstan) and diversify equipment models, (ii) engage local counsels to perform legal and operational due

diligence to ensure high likelihood of enforceability before entering into contracts, which must clearly specify ownership transfer schemes, mining power delivery obligations and remedies during defaults, and (iii) engage at least two security firms to audit the project's dApp code.

8 Team, Partners and Governance

The program team consists of mining veterans with four years of experience constructing and managing mining sites in Yunnan, Sichuan, Xinjiang and Inner Mongolia provinces of China. Assets under the team's management include those of some of the largest cloud mining providers in the world. More information about the program team may be found at <https://1-b.tc>.

Founding partners of BTCST include institutional miners with more than 2000 PH/s of mining power under management. These founding partners and the partnering mining pool will form a governance board that collectively decides on material issues of the project, which include new issuances, cost level adjustments, surplus profit distribution and future features. The governance board will have three seats upon launch, two of which to be occupied by the project team and one by the partnering mining pool.

9 Roadmap

Nov. 2020	Preparatory work for project launch
Dec. 2020	Proof-of-Concept Issuance: Up to 100p
Feb. 2021	Batch 1 Issuance: Up to 1000p
Mar. 2021	Self-owned mining sites acquisition and construction
Jun. 2021	Batch 2 Issuance: Up to 1000p