

Canxium Blockchain

By Canxium Foundation

Abstract. Canxium is a blockchain that allows offline mining and supports several mining algorithms.

1. Introduction

Since 2009, A lot of blockchains have been released with the same concepts: Designed to be inflation or deflation only. Bitcoin is deflation by design, Ethereum is inflation before the Merge. We propose another concept: The total supply of the coin will be determined by supply and demand, when the demand is too high, price goes up, miners get more profit and more miners come to mine Canxium leads to hashrate/difficulty goes up and more Canxium will be added to the market. Because the higher the difficulty, the greater the reward. Same thing happens when the demand is too low. We also introduce a new mining concept: Offline mining.

2. Canxium

The Canxium blockchain is in many ways similar to the Ethereum blockchain, although it does have some differences. The main difference between Canxium and Ethereum with regard to the blockchain is offline mining and mining reward is fixed and calculated by difficulty.

3. Accounts

Like Ethereum accounts, with each account having a 20-byte address and state transitions being direct transfers of value and information between accounts. An Canxium account contains four fields:

- The nonce, a counter used to make sure each transaction can only be processed once.
- The account's current Canxium balance.
- The account's contract code, if present.
- The account's storage (empty by default).

4. Transactions

Same as the Ethereum transaction. Canxium transactions support another transaction called mining transaction:

- Mining difficulty: Each miner chooses their target difficulty to mine.
- Mining algorithm: Miner chooses the algorithm to mine.

- Mining nonce: A nonce which satisfies the Pow target difficulty.

5. Block Mining

Canxium blockchain will start with the Pow consensus and plan to move to another consensus in the future. Blocks are finalized using Ethash algorithm and mining is the only way to create canxium coin, even if we switch to another consensus like DPoS or PoS, we can still keep making more coin through transaction mining. We believe that canxium coins should not be printed out of nowhere and the reason we should not use the Pow in block mining is to protect our environment, pow mining is necessary but should not be the only way to operate the chain. The chain should be operated using an algorithm that uses less energy: Validators create and validate blocks in a PoS network, miners mine and broadcast the mining transaction to validator in order to create new Canxium coins.

6. Offline Mining

Transaction mining is a new concept, but like block mining, miners create new accounts and make a brand new transaction with a valid account nonce. Finally, miners calculate the mining nonce until it satisfies the chosen Pow difficulty and algorithm. Miners are free to broadcast the transaction right away or keep it for later if they want.

Miners choose their target difficulty and start mining until they reach the difficulty, they don't have to care about block time or anything else.

7. Mining Reward

Rewards are pay per difficulty hash no matter if it's block or transaction mining, below are the rewards for Ethash algorithm: 500 nCAU/hash. Foundation funds will receive 2%.

Rewards are reduced five percent every two years to keep up with technological developments.

1 nCAU = $1e-18$ CAU. 1 mCAU = $1e-9$ CAU

Difficulty	Mining Reward	Miner Reward	Foundation Funds 2%
1000000000000000	0.005 CAU	0.0049 CAU	0.0001 CAU
10000000000000000	0.5 CAU	0.49 CAU	0.01 CAU
100000000000000000	5 CAU	4.9 CAU	0.1 CAU

Block reward for the first year is different, because we need some coins in circulation: a fixed 0.25 CAU is paid for each block number smaller than 4,204,800. Foundation funds will receive a 25% reward for the first year in order to raise capital.

	Foundation Fund (%)	Hydro Hard Fork Block	
	25.00	4,204,800	
Block Reward (CAU)	Miner Reward	Foundation Fund	Reward
0.25	788,400	262,800	1,051,200

8. Transaction Fee

Transaction based fees are set to 2 nCAU per 100 KH difficulty in Pow chain, in Pos chain it'll be changed to the same as Ethereum calculation. More information can be found here: [Canxium Sheet](#)

In order to create a contract on Canxium network, creator have to pay 100 CAU per contract, this creation fee will be sent to Foundation Fund and will be used to develop the Canxium ecosystem.