



# Will there be a Surge after the Merge? - A Quantitative Analysis of Post-Merge Impact on the Market

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## **Abstract**

The Merge of Ethereum is the migration of the network consensus scheme from Proof of Work (POW) to Proof of Stake (POS), which is expected to start on Sept 19, 2022. Its influence on the market is complex and profound.

This article aims to provide readers with a foundation to anticipate future market trends of ETH and related assets, from the market perspective, using an in-depth and comprehensive analysis on the change in supply and demand as a result of the Merge.

The following may come into effect:

1. Issuance of ETH shrinks by 90%, entering deflation;
2. The number of ETH being staked dramatically increases as earnings for staking and transaction fees are desired. 13.4 million ETH, at least, will change status from in-circulation to staked;
3. Willingness to purchase and hold ETH increases in the short run for the forked tokens are desired. If the forked chain absorbs over 20% of the hashrate from Ethereum, price of the forked tokens could exceed US\$138;
4. The Merge may encourage some of the POW miners on Ethereum to switch to ETC, injecting possibilities of an ETC price increase. Should the transfer of hashrate exceed 10% of Ethereum, the price of ETC could increase by 4 times, approaching US\$150.

The merge of Ethereum is the migration of the network consensus scheme from Proof of Work to Proof of Stake, which is expected to start on Sept 19, 2022. Its influence on the market is sophisticated and profound not only for the Ethereum ecosystem, but also poses intense uncertainty and possibilities for other ecosystems. For specific details regarding the Merge, a detailed introduction, titled [\*All You Need to Know about the Merge of Ethereum\*](#), was published by Huobi Research earlier this year for reference.

This article aims to help readers better predict the market trend of ETH and related assets. The word “surge” in the main title is copied from the original Ethereum roadmap; in this article, the word is meant to refer to the asset’s potential price increase and excludes technological development.

The market trend of ETH is subject to two long-term factors and one short-term factor:

- The overall deflation due to the reduction in ETH issuance
- The decrease in circulation due to the Merge because an enormous amount of ETH will enter POS
- The short-term increase in willingness to buy and hold ETH in order to receive forked tokens

## **1 The Deflation Era after the Merge of ETH**

New production of ETH may be lower than the amount being destroyed, which may lead ETH into deflation. Current newly produced ETH are mostly from POW rewards, nearly 90% of total volume. This portion of ETH will disappear after the Merge, so new production of ETH will substantially decrease, which the community calls “triple halving”. However, the amount being destroyed is closely related to on-chain activity: if the activity in the future does not differ from that in the past year at large, the amount remains the same. As a result, if ETH experiences deflation: its price may increase as an answer to the short-term deficiency in supply.

The calculation of ETH net new production before and after the Merge is elaborated in the following for reference.

### 1.1 Net New Production of ETH before the Merge

The deflation rate of ETH obeys the following formula regardless of before or after the Merge:

Net New Production= Total New ETH Production – ETH destructed

Before the Merge, total new production of ETH is composed by two parts: rewards from POW and staking rewards from Beacon Chain.

#### *POW Rewards*

The Ethereum Network rewards ETH to miners when a new block is produced. Technically, the average time to produce a block is between 12 seconds to 14 seconds. If it is set at 13.5 seconds, the rewards to be received for producing a new block would be 2.1 ETH for each block generated, and a commensurate annual amount of 4.91 million ETH (rewards for a new block is composed by base rewards + transaction fees +rewards for packing uncle block).

#### *Staking Rewards*

The term staking refers to the action of depositing 32 ETH into the Beacon Chain of Ethereum to activate the verifier status; a verifier is responsible for storing data, processing transactions and adding new blocks. During the process, the verifier could receive additional ETH.

According to Ethereum.org, current total amount in staking is 13,883,221 ETH with APR of around 4.2%, which is approximately 583,100 ETH.

#### *ETH Burn*

When EIP-1559 is in effect, Ethereum will eliminate the base fee from the gas fee. According to [watchtheburn.com](https://watchtheburn.com), since the announcement of EIP-1559 on Aug 5, 2021, 2.5696 million ETH was destructed, approximately 2.5838 million annually.

The net new production can be calculated by:

ETH POW Rewards + ETH Staking Rewards – Amount of ETH Burn = 2.9093 million ETH

Given that that total current supply is 121.81 million, the annual deflation rate before the Merge

would be 2.39%.

## 1.2 Net New Production after the Merge

POW rewards will be renounced after the Merge and new ETH can only be produced via staking rewards; the formula above is hence changed to:

Net New Production = ETH Staking Rewards - Amount of ETH Burn

*Total ETH staking rewards after the Merge:*

Staking rewards on Ethereum Beacon Chain will experience minor change according to factors as hashrate and block generation, and we assume the annual total rewards is constant at 583,100 ETH.

*ETH Burn*

The amount of ETH burn depends on the overall activeness of projects on Ethereum. Therefore, the amount of ETH burn in the next year cannot be estimated; here, we assume the amount of ETH burn remains constant at 2.5838 million.

Net new production of ETH after the Merge in the next year will be:

ETH Staking Rewards - Amount of ETH Burn = 2.0007 million ETH

Given current total supply of ETH of 121.81 million, the deflation rate would be 1.64%, which signals a deflationary phase for the token.

## 2 Increase in Demand on Staking under POS

After the Merge, the newly revamped Ethereum will process transactions as usual, such as transfers, staking inquiries, calls on smart contracts, etc., which would impose Tips in gas fee that do not exist on the original Beacon Chain. Tips is an incremental income that will elevate the level of earnings. This would deem it appealing for new investors to participate in staking, thus escalating the level of ETH in staking. In other words, the ETH in staking will exit from being in circulation, which would signal positivity for its price. Compared to deflation, the increase in the

amount of ETH in staking appears to be stronger in reinforcing the price of ETH.

The amount of ETH in staking before and after the Merge will be calculated in the following:

Total amount of ETH in staking before the Merge is relatively simple to uncover. According to Ethereum.org, current amount of ETH in staking on Beacon Chain is 13,883,221 ETH, which accounts for 11.4% of the total supply of ETH with an APR of 4.2%.

Total amount of ETH in staking after the Merge can be speculated using the following logic. Additional earnings could attract higher amounts of ETH into staking, but also dilute the level of earnings for staking players. These two effects will offset each other and reach a balance: total amount of ETH in staking can be estimated by the quotient of income from staking divided by yield of staking.

After the Merge, previous Tips and MEV fees received from POW will be transferred to participants in staking, aka verifiers. Hence, total income for verifiers will be constituted by ETH rewards in staking, Tips and MEV. As performance of the three income contributors cannot be estimated for the coming year, we shall assume it remains constant as with before the Merge. It is rational to make such assumption as the Merge does not directly interfere with network performance and block storage.

According to [watchtheburn.com](https://watchtheburn.com), total Tips since the announcement of EIP-1559 on Aug 5, 2021 accumulated to 457,697 ETH, or 460,219 ETH in annual terms.

According to [explore.flashbots.net](https://explore.flashbots.net), total MEV fees were approximately US\$305.5 million from Aug 3, 2021 to Aug 3, 2022. With reference to the average price of ETH which stood at US\$2,956 in the previous year, this would be equal to 103,300 ETH.

Total earnings for participants in staking under POS is the sum of the 3 components:

ETH Staking Rewards + Tips + MEV fees= 1.1466 million ETH

As current total amount of ETH in staking is 13.88 million ETH on Beacon Chain, APR for participants in staking will reach 8.26%.

This higher APR could draw more users to enter staking and becoming verifiers. Holding total rewards constant, APR will be lower, which leaves us with a question: what is a reasonable APR that could lead to a balance as aforementioned?

The latest interest rate from the FOMC Meeting was announced at being between 2.25% to 2.5%; in this case, earnings from ETH staking must be higher than that in the traditional financial world in order to become more appealing. For convenience, we shall assume the APR for ETH staking for the next year is consistent with that on the current Beacon Chain at 4.2%.

**Total amount of ETH in staking = income of verifiers ÷ current APR on Beacon Chain = 27.3 million ETH, implying a 20% staking rate on the network.**

Change in the amount of ETH in staking before and after the Merge is calculated below:

27.3 million ETH – 13.88 million ETH = 13.42 million ETH

This sets forth an incremental amount of 13.42 million ETH that will enter staking, which accounts for 10% of total supply. Correspondingly, the amount of ETH in circulation will face a sharp decrease, which will boost the market's willingness to purchase ETH.

The above proposed is a conservative estimation on the amount of ETH in staking — the actual level of circulation may experience a more intense shrink. First, compared to a common staking rate of 40% on other Layer 1 chains, there is plenty of room for staking on ETH. Second, staking on ETH is much less risky compared to other protocols, therefore the interest rate offered by ETH staking is reasoned to be lower than that on other protocols. Interest rates for deposits is lower than 1% on current mainstream lending protocols such as Compound and Aave. Consequently, future ETH interest rate in staking may fall under 4.2%, which heralds more ETH entering staking and exiting from circulation. Given such circumstances, how ETH's price will trend is anyone's guess.

### **3 Short-term Demand after Forking**

Under Vitalik's lead, most developers and community members have committed to adhere to the Merge and the change to POS. But miners will vanish during the process, and the desire to find a way out becomes urgent. On one hand, forking has presented itself as an option. By forking, hashrate of ETH could be divided and loss of miners could be alleviated. If the forked proposal could receive support from some of the participants in the ecosystem, it could become an independent ecosystem. If a sustainable future is desired for the forked chain, the token price

must be commensurate with the level of hashrate it receives.

On the other hand, for ETH holders, ETH held in their wallet may be eligible to receive various types of forked tokens, which is valuable to a certain extent; some investors may buy ETH just to receive such forked tokens, which refers to the willingness to buy mentioned at the beginning of the article. This demand will be released the forked tokens are rewarded; the influence on the market may be fleeting. Conditions to produce forked tokens are elaborated below.

### 3.1 Valuation of Forked Tokens

After forking, how will the newly emerged forked tokens be valued?

For POW, price of token is positively correlated to hashrate: the higher the price, the more miners will flock to compete in mining. Conversely, when the price goes down, miners with old equipment will exit temporarily.

When POW mining is abandoned by Ethereum, miners will have nowhere to claim earnings. Some alternatives, less attractive than the previous, have begun to be considered. Current hashrate per unit on ETC is less than 70% of that on Ethereum. It is reasonable to predict that future forked tokens may be similar to ETC in terms of hashrate per unit, and miners are more than likely to adopt this as an alternative. Therefore, the following formula is reasonable:

$$\text{Hashrate of Forked Tokens} / (\text{Annual Production of Forked Tokens} \times \text{Price of Forked Tokens}) = \text{Hashrate of ETC} / (\text{Annual Production of ETC} \times \text{Price of ETC})$$

Assume 20% of ETH hashrate is migrated to a new forked network, then the hashrate for the forked one would be 176.6 TH/s. For convenient calculation, assume the forked token has the same production as ETC, according to the following calculation:

$$\text{Price of Forked Token} = \text{Hashrate for Forked Network} \times (\text{Price of ETC} / \text{Hashrate of ETC}) = \text{US\$138.42}, \text{ which is around 8\% of the current ETH price.}$$

This price is a price floor for forked tokens when 20% hashrate is migrated. Hashrate is not everything, nor does it mean “the bigger, the better”. When sufficient hashrate is present, the price of tokens must be at a commensurate level with the cost of the mining equipment cost, otherwise the hashrate will shrink from time to time eventually. It is possible that miners will take lower earnings for an answer: the general logic for miners is do a horizontal comparison with

other projects and choose the best one; the price cannot be lower than their desired level.

### 3.2 Challenges for the Forked Network

Forking of ETH is not a silver bullet. In the short-run, prisoners' dilemma between miners would be the problem to tackle; in the long run, the development path of the forked chain, also a new Layer 1 chain, is waiting to be structured.

#### *Prisoner's Dilemma of Miners in the Short Run*

If only one network exists after forking, or in other words, most miners choose to support only one forked network from ETH, it would be the most ideal. By this path, consensus could be co-ordinated and optimized so that projects on Ethereum could be attractive to as many developers as possible. In fact, miners in different groups may act in their best interests, and many forked tokens may be born as a consequence. Some of them could be so volatile that only one or two projects will survive while others crack in the cradle due to the lack of ability to continuously construct the ecosystem. Since power is diluted in such a situation, surviving forked projects may still fall several worlds behind Ethereum with POS; which would be less than ideal for sustaining development of the ecosystem, and becoming the second ETC.

#### *Future Development*

The Merge, sharding and Layer 2 solution exist only to solve the network congestion. But can forking be an efficient solution? If the forking is merely to enlarge current block storage and inheriting current Layer 2 network, it would be easily defeated in the coming competition with its parent Ethereum and other new Layer 1 chains. It never lacks for projects that specialize and win in one single advantage in the Layer 1 world. Forked chain from ETH is also a new Layer 1 chain; it must win the market through innovation.

Let us now examine the impact of the Merge on other ecosystems.

## **4 Spilt Hashrate may Boost the Price of ETC**

The Merge is a migration of POW to POS, which implies that POW miners will be abandoned after the Merge. The POW miners may, however, still have an impact on the market.

A feasible option would be for miners to switch to existing blockchains that are minable by graphics card. Current blockchains that support mining by graphic cards are: ETC, ERG, RVN, CFX, FLUX, FIRO, etc. Among this list, ETC has the largest hashrate and market cap, and offers the best compatibility with Ethereum. Some of the hashrate on ETH, in our opinion, will migrate to ETC, which solidifies network security and increases the confidence level in the ecosystem. If the development level could catch up with the growth rate of hashrate, the price could experience an increase.

However, current mining machines for ETH are one step away from turning to ETC mining: the current hashrate on ETC is barren, and the influence on the network from the migration of hashrate could be overwhelming. Current hashrate of ETC is merely 29 TH/s, accounting for less than 1/30 of ETH, which lays claim to 883 TH/s. Regardless of 51% attack, only 3% of hashrate migration might cause a double in ETC hashrate, which reduces earnings of ETC miners by 50%. To reimburse the reduction in earnings, the price of ETC must increase, which poses a dilemma:

- Increase in price is a result of production from the secondary market, which is supported by sufficient contributions from ecosystem; and in order to have sufficient support from the ecosystem, a high level of security is a must.
- If high level of security is desired, there must be sufficient hashrate. Hashrate relies on miners, miners desire more earnings, and price of tokens must high enough to produce sufficient earnings.

The market has kickstarted this cycle: ETC has experienced a price increase; the hashrate and price temporarily entered a positive spin. Yet, it remains to be seen if the speed of development of the ecosystem and innovation could catch up with any growth in price. If ETC is capable of receiving 10% hashrate from ETH, then the price of ETC could potentially be four times the current price (US\$148 versus the current US\$37). Admittedly, the cycle may end any time and hashrate and price of ETC will stick to a range around the equilibrium. The best outcome for ETC is a balance where hashrate, price and ecosystem development reach a harmonious state.

## 5 Options of Miners and Influences on the Market

Lastly, we briefly compare the preference of miners for forked tokens or ETC, and evaluate the respective tokens.

First, for POW miners, no technical issues exist in both tracks so they can switch between networks as they wish; one barely differs from the other in the short run.

From the ecosystem development perspective, projects existing in the ecosystem will be naturally deployed on the forked network without any migration costs. Moreover, ETH holders will receive forked tokens, which is effective for attracting users to enter the network, and such a move would help the forked network accumulate user base at its early stage. By contrast, the same action requires migration cost to be deployed on ETC, and user base on ETC is much smaller. As a result, the forked network is more appealing to miners: more hashrate is desirable, and leaves more room for imagination on how the price will trend. Not all hashrate will flow to the forked network; ETC will likely still receive some share of that increase and an increase in ETC price is possible.

In the forked network, or maybe various forked networks, only the ones that are more appealing to developers will triumph, and their tokens are the ones that will hold long term value.

On top of the two outlets, miners could start over on his or her own with the genesis block to maintain a new POW network, or simply stop mining, selling mining machines or turn to Web 2 related businesses. The first option requires tremendous effort and resources; but very few assets, users and projects are in the ecosystem as yet, which makes it difficult to start and a bad choice in the short term. Whereas the other options mean goodbye for miners, which, in the crypto world, is merely a drop of water amidst an ocean.

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