

Authored by:



Christian Hazim
Research Analyst



Erik Anderson
Research Analyst

Date: April 11, 2023
Topic: **Digital Assets**



GLOBAL X ETFs RESEARCH

The Shanghai Upgrade: Finalizing Ethereum's PoS Transition

Ethereum's transition to a Proof-of-Stake (PoS) network marked the beginning of a major shift in Ethereum's infrastructure. In addition to overhauling the network's consensus mechanism and drastically reducing its energy consumption, the shift to a PoS system ("The Merge") also introduced the foundation needed to improve Ethereum's transactional capacity and scalability. These upgrades can be further explored in [The Merge: Supercharging Ethereum](#).

Since "The Merge," the network has been secured by validators who have bonded or "staked" their ether (ETH) tokens to the Beacon Chain, Ethereum's consensus engine. The process of staking, however, has been a one-way street as the network has not allowed validators to withdraw their staked assets. For Ethereum to become a fully-operational PoS network and for "The Merge" to be considered complete, the ability to withdraw staked assets is critical.

In this report, we will explore Ethereum's upcoming and highly-anticipated Shanghai Upgrade, a software update that will enable staking withdrawals and mark the final step of Ethereum's transition to PoS.

Key Takeaways

- Since the inception of the Beacon Chain, network participants have staked ETH to secure Ethereum network activity in exchange for ETH-denominated rewards. To date, the Beacon Chain has not allowed for the withdrawal of staked ETH or their associated rewards.
- The Shanghai Upgrade, scheduled for April 2023, is expected to unlock the withdrawal of staked ETH from the Beacon Chain.
- Removing the restrictions on staking withdrawals fundamentally changes the risk and liquidity considerations associated with staking. This change is expected to make Ethereum a more complete PoS network, and its native asset ETH a more capital-efficient vehicle.

Staked ETH Is the Foundation of Ethereum's Security

Scheduled for April 2023, the Shanghai Upgrade includes various changes to Ethereum's code base, referred to as Ethereum Improvement Proposals (EIPs). Among the changes being implemented in the upgrade, EIP-4895 is the most important as it allows for the withdrawal of staked ETH from the Beacon Chain.

The Beacon Chain is Ethereum's PoS consensus engine first launched in December 2020. The Beacon Chain is responsible for coordinating how the network's nodes come to an agreement about the state of the blockchain. In other words, it ensures that all nodes have a consistent copy of the blockchain's ledger and that all transactions are valid and secure.

Prior to Ethereum's transition to PoS, the Beacon Chain operated in parallel to the Ethereum blockchain and served as a sandbox for developers to test the PoS code. During the event referred to as "The



Merge,” the legacy Ethereum blockchain merged with the Beacon Chain, effectively switching Ethereum from a Proof-of-Work (PoW) to a PoS network.

Since the Beacon Chain’s inception, network validators have been bonding or “staking” ETH for the right to validate network activity. To date, about 18 million ETH, or around 15% of the circulating supply of ETH has been staked to the Beacon Chain, representing roughly \$32.9 billion of economic security.¹ In exchange for these services, validators have been earning ETH-denominated rewards issued by the network, worth approximately \$2.3 billion as of the current price of ETH.²

In exchange for these rewards, staking participants have been required to lock their ETH to the Beacon Chain staking contract indefinitely. The inability to unstake ETH following “The Merge” was an intentional choice made by Ethereum core developers as it ensured the new PoS consensus engine worked flawlessly in its initial stages. Unsurprisingly, the illiquidity associated with staking has sidelined many prospective stakers. With months of Ethereum operating under a PoS consensus mechanism, however, developers are now confident that the necessary conditions have been met to safely implement withdrawals from the Beacon Chain.

The Shanghai Upgrade is Expected to Benefit Liquidity and Network Security Over the Long Run

Removing restrictions on staking withdrawals is expected to fundamentally change the risks associated with staking ETH to the Beacon Chain. Primarily, the Shanghai Upgrade removes the execution risk surrounding the software upgrade. Albeit small, the risk of unforeseen issues arising during software updates can be a concern for participants. Given that capital investment is a prerequisite for staking, execution risk can be enough to convince prospective stakers to remain on the sidelines. In addition, the implementation of staking withdrawals is expected to improve the liquidity profile of staked ETH, thereby reducing liquidity risk. In an asset class known for its volatility, the ability to efficiently enter and exit investment positions is paramount.

The seamless staking and unstaking of ETH from the Beacon Chain also holds implications for the capital efficiency of the Ethereum network and its native asset. ETH is an asset with a high degree of utility. It must be spent during the execution of any transaction on the Ethereum network, is a widely-accepted and high-quality form of collateral, and is used as a medium of exchange. With the implementation of staking withdrawals, staking and unstaking ETH will become a more efficient process, further expanding ETH’s utility by providing users with a means of accessing a fairly liquid and passive income stream. In practice, this use case will be akin to depositing excess cash into a short-term money market fund until a more compelling need for the cash arises.

The Shanghai Upgrade is also likely to have positive downstream effects on the security of the Ethereum network. PoS networks such as Ethereum rely on the value of staked assets to protect the network from attacks. So long as no malicious actor controls a majority of the capital staked to the network, the network is able to resist any attempts to manipulate current or historical transactions. This relationship means that PoS networks can improve their economic security via a few avenues: price appreciation of staked tokens, an increase in the number of tokens staked to the network, or a combination of the two. As the implementation of staking withdrawals represents a relative reduction in the risks associated with staking, it is possible that the amount of ETH staked to the Beacon Chain may grow as previously sidelined participants are incentivized to capture staking rewards. Should this occur, Ethereum’s economic security should become more robust all else equal.

After the implementation of the Shanghai Upgrade, validators will have the ability to automatically withdraw accrued staking rewards. Those validators seeking to fully exit network staking will have to follow a gradual and dynamic release process intended to moderate the flow into and out of the staking contract in order to protect network security.



On the surface, the changes that the Shanghai Upgrade will bring to Ethereum are simple. This software update, however, will effectively complete Ethereum's transition to PoS and bring the network one step closer to realizing its long-term vision.

Footnotes

1. Etherscan (n.d.). Beacon Chain Deposit Contract 0x00000000219ab540356cBB839Cbe05303d7705Fa. Accessed on April 3rd, 2023.
2. Staking Rewards (n.d.) Ethereum (ETH) – Revenue. Accessed on April 3rd, 2023.

Investing involves risk, including the possible loss of principal. Diversification does not ensure a profit nor guarantee against a loss.

This material represents an assessment of the market environment at a specific point in time and is not intended to be a forecast of future events, or a guarantee of future results. This information is not intended to be individual or personalized investment or tax advice and should not be used for trading purposes. Please consult a financial advisor or tax professional for more information regarding your investment and/or tax situation.

