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Ethereum's Scalability Transition, Competitive Positioning and Long-Term Viability

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Key Takeaways

ETHEREUM

01

Ethereum is undergoing a multi-layered, multi-year transition to increase its transaction throughputs.

- The network is gradually improving transaction throughput through gas limit increases, L2 solutions, and technological upgrades like Proto-Danksharding (EIP-4844) and Beam Chain.
- These improvements are necessary to support both high-value transactions and mass-market adoption, ensuring Ethereum remains the dominant decentralized smart contract platform.

02

Ethereum currently has limited use cases at its current transaction cost compared to centralized alternatives like Tron, Solana, and even Base.

- Despite being more expensive, Ethereum provides superior decentralization and security, making it the preferred choice for RWA adoption, institutional stablecoin issuance, and DeFi.
- The increasing institutional participation and regulatory clarity (i.e. DeFi deregulation) will likely expand Ethereum's use cases beyond its current high-fee segments.

03

To remain competitive as both a transactional network and an investment asset, Ethereum must significantly increase its gas limit.

- A higher gas limit would allow Ethereum to maintain low transaction costs while increasing overall fee revenue, reinforcing its deflationary mechanism.
- This expansion is essential to ensure that ETH remains a secure, scalable, and economically viable settlement layer that can compete with centralized alternatives while preserving its decentralization ethos.



Introduction

Ethereum operates under an evolving transaction fee model where part of the transaction fees is burned under EIP-1559, directly affecting ETH's supply. In February 2025, the network's gas limit, the transaction throughput, was increased by ~15%, significantly impacting transaction fees and fee burn dynamics.

This article investigates the reasons behind the observed decline in fee burn and ETH issuance and assesses its long-term implications.

Ethereum's Gas Limit and Its Role in Network Scaling

Ethereum's gas limit functions similarly to Bitcoin's block size limit, determining the number of transactions that can be processed per unit of time. Unlike Bitcoin, Ethereum dynamically adjusts its gas limit based on network upgrades and hardware improvements. The February 2025 update expanded the gas limit, increasing transaction supply while maintaining network decentralization and security.

Ethereum offers a premium product in the blockchain space—highly secure and decentralized block space. However, with premium block space comes premium pricing, and Ethereum's historical trade-off has been scalability. This aligns with the blockchain trilemma, where achieving all three properties—security, decentralization, and scalability—is a significant challenge. While Ethereum prioritizes security and decentralization, its scalability efforts have been offloaded to Layer 2 solutions (L2s) such as rollups, which process transactions off-chain while inheriting Ethereum's security model.

Impact of Gas Limit Increase on Gas Prices and Fee Burn

Following the gas limit increase, Ethereum's average gas price dropped to 1/4 to 1/5 of its previous levels. Since total network fee revenue is calculated as:

$$\text{Total Fees} = \frac{1}{2} \times \text{Gas Price} \times \text{Gas Limit}$$

Even a moderate gas limit expansion can lead to a disproportionate decline in gas prices, temporarily reducing ETH burn and increasing net ETH issuance.

Ethereum's fee revenue, while temporarily reduced, continues to reflect the network's standing as the preferred settlement layer for uses cases such as DeFi and L2s, given that its usages continue to trail between 12-15 TPS.





Economic Model of Ethereum's Transaction Demand

Using economic principles, we analyze the relationship between gas prices, transaction demand, and transaction supply:

01 High-fee's zone, inelastic demand

When fees range from a few cents to several dollars (see Table 1 for comparisons), demand remains relatively stable as transactions involve high-value activities, including:

- Real-World Asset (RWA) settlements and large transactions.
- Trading and L2 settlements, which require Ethereum's secure execution layer.
- High-frequency traders (HFTs) and arbitrage bots, which bid extreme fees to secure MEV opportunities.

02 Low-fee's zone, elastic demand

Below a certain threshold (sub-20 cents), transaction demand surges as mass-market use cases become viable, including:

- Retail payments (e.g., point-of-sale transactions, e-commerce).
- Machine-to-machine (M2M) payments (e.g., IoT transactions, autonomous agent interactions).
- Gaming transactions (e.g., in-game item purchases, on-chain logic execution).

Ethereum is clearly differentiated from blockchains such as Solana, Tron, and even Base, which are highly scalable but significantly more centralized and less secure. These networks have a greater susceptibility to 51% attacks due to their lower number of validators and reliance on permissioned infrastructure. While these blockchains achieve higher throughput, they compromise on trust minimization and decentralization, making them less ideal for institutional and high-value transactions that require Ethereum's security guarantees.

The gas price crash in February 2025 was due to supply-side expansion, not a demand-side drop. Since current transaction demand remains in the inelastic range, increasing supply caused a sharp price drop without an immediate rise in transaction volume. However, Ethereum's developers continue to work on enhanced scalability solutions, such as the rollout of the Beam Chain, which aim to bridge the gap between premium security and mass adoption.





Blockchains	Total Transactions	Transactions per Second	Total Fees	Cost per Transaction
Ethereum	432,658,032	13.72	\$1,514,346,426	\$3.50
Tron	2,621,343,062	83.12	\$604,409,991	\$0.23
BNB Chain	1,465,241,336	46.46	\$198,508,442	\$0.14
Base	2,034,314,653	64.51	\$88,730,018	\$0.04
Solana	28,153,497,057	892.74	\$1,027,167,260	\$0.04
Aggregate	34,707,054,140	1,100.55	\$3,433,162,138	\$0.10

Data as of March 31st, 2025. Source: Artemis, the data is the trailing 12 months blockchain activity between April 2024 to March 2025.

Table 1

The Role of ETH Demand and Price Dynamics

Since the natural demand for ETH, measured by the aggregate value of transaction fees paid, has decreased in recent months, this may indicate a contributing factor to the price depreciation of ETH. Transaction fees serve as an essential component of ETH's value proposition, as they directly impact its deflationary mechanism under EIP-1559. A prolonged decline in transaction fees reduces the rate at which ETH is burned, increasing net issuance and potentially leading to downward pressure on ETH's price.

It is important to note that while Ethereum users temporarily hold only 0-5% of ETH as transaction fees, ETH investor-stakers bear the principal risk of holding 25-50% of the total ETH supply for the long term. This makes fee burning a crucial factor for ETH's long-term appreciation. Without sustained deflationary pressure from burned fees, the value proposition for long-term ETH holders could weaken, impacting overall market confidence in ETH as a store of value.

In the long term, if ETH is to remain competitive in transaction costs while still being a viable investment asset, it must significantly increase the gas limit. A much larger gas limit would allow Ethereum to support higher transaction throughput, increasing aggregate fee revenue while keeping per-transaction costs low. Expanding Ethereum's gas limit many folds beyond today's levels would help sustain its value proposition, ensuring that ETH remains both a scalable, yet very secure settlement layer and a deflationary asset.





Long-Term Outlook: Ethereum's Deflationary Mechanism and Scalability

As Ethereum scales further through L2 rollups, Native Rollups, and Beam Chain, transaction fees will stabilize, and demand will expand into the elastic zone. Over time:

- 01** Fee revenues will increase as L2s, and institutional use cases contribute fees to Ethereum.
- 02** ETH burn will accelerate, reducing net issuance.
- 03** ETH will sustain both high utility and scarcity, differentiating it from other blockchains.

Conclusion

The recent decline in Ethereum's fee burn is a temporary phase driven by increased transactional throughput. As demand shifts into the elastic range, Ethereum will achieve a self-reinforcing cycle of high transaction volume, strong fee revenue, and ETH scarcity. Unlike Bitcoin (which lacks utility-based fee growth) or Solana (which sacrifices decentralization), Ethereum is uniquely positioned to balance security, scalability, and deflation.

Ethereum's future remains strong. Current fee reductions should be seen as a strategic transition rather than a weakness. As network activity increases, ETH's scarcity will accelerate, reinforcing its long-term value proposition.





Contact

For further information regarding investment opportunities in Ethereum please contact Laser Digital Asset Management at am@laserdigital.com

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