# Summary – Introduce EIP1159

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## I. Introduction

Let's start with what eips are actually are. Eip stands for Ethereum improvement proposal and is a common way of requesting changes to Ethereum network inspired by bitcoin improvement proposals bips. An eip is a document covering technical specifications of the proposed change and the rationale behind it.

Let's quickly review how the previous Ethereum fee model works, the block size is capped at a regular gas limit, the only way to get into a block is to bid higher than the other users, so the previous fee model is based on a simple auction mechanism also known as a first-price auction. The users who want to have their transaction picked by a miner have to essentially bid for their space in a block. This is done by submitting a gas price that they are willing to pay for a particular transaction. The miners are incentivized to pick up transactions by sorting them by the highest gas price and including the most profitable ones first.

Previous fee model example:

Imagine the minimum gas fee to be included in the previous block was 50 GWei, the network activity seems to remain the same, so users start submitting their transactions with 50 GWei trying to be included in the next block. At the same time, some users increase their bids for prioritizing their transactions with 100 GWei. Now, the minimum required gas fee to be included in the next block is 100 GWei. If the network activity remains high for multiple subsequent blocks, the users who already submitted their transactions with 50 GWei may wait for the confirmations for a very long period. In this case, fewer users are lucky enough to submit their transactions with a default fee, just because a spike in gas fees may end up waiting for the transactions to be confirmed for a long period. This is of course not ideal from the user experience point of view.

This is also where eip-1559 comes into play. The proposal was made to accommodate these problems and it aims to achieve the following goals: making transaction fees more predictable, reducing delays in transaction confirmation, improving user experience by automating the fee bidding system, creating a positive feedback loop between network activity and the eth supply. Eip-1559 has some big implications when it comes to the eth monetary policy and it describes changes to the Ethereum fee model and it was put forward by vitalik buterin in 2019.

Eip-1559 fee model example:

The big pat of eip-1559 is an increase in the network capacity achieved by basically doubling the block size. With the base fee, the minimum fee that has to be paid by a transaction to be included in a block and increased network capacity, eip-1559 can build the following logic when the network is at more than 50 percent utilization, the base fee is incremented, when the network is at lower than 50 percent utilization, the gas fee decremented. This means that the network aims at achieving equilibrium(balance) at 50 capacity by adjusting fees accordingly to the network utilization.

Let's go through the same scenario this time. With eip-1559 in place in the previous block, the 50 GWei is the base fee and the network utilization is at 50 percent. With most blocks using 15MB gas target half of the max gas limit, the spike caused by some new tokens results in users submitting their transactions with a higher miner tip. Seeing the high demand of the block space and lots of transactions with high miner tips, the miners produce a block that is at the max cap limit of 30MB gas limit. This results in more transactions being included in a block, but it also causes the base fee to be increased in the following block as the current block is 100 percent full. If the network activity and demand for block space remain high, the miners would keep producing full blocks, increasing the base fee with subsequent blocks. At some point, the fee would high enough to drive off some of the users causing the network to start coming back to below 50 network utilization and lowing the fees in the subsequent blocks.

Eip-1559 also introduces a miner tip, a separate fee that can be paid directly to the miner to incentivize them to prioritize a transaction, this is very similar to the previous auction mechanism where the miners can be incentivized by higher gas fees. This part is really important for transactions that take advantage of quick confirmation. To avoid a situation where miners can collude and artificially inflate the base fee for their own benefit, the entire base fee is burned. The base fee is always entirely burned and the minor tip is always entirely received by the miners. There is another concept known as a fee cap, this can be set by users who would like to limit how much they want to pay for a particular transaction instead of just paying the current base fee.

What's the usage of eip-1559?

The eip-1559 decreased the gas fee because users could adjust their miner tips according to their demands, for example, transactions with a fee cap that is set lower than the current base fee would have to wait until the base fee is lower than the max fee set in fee cap to be included in a block.

Less profit for the miners, the miners in the previous fee model receive both the block subsidy reward and the entire gas fee. After the changes in Eip-1559 are implemented, the miners would only receive a block reward plus the miner tip.

The base fee burning. The base fee burning also has major implications when it comes to the eth supply, burning the base fee creates an interesting feedback loop between the network usage and the eth supply. More network activity equals more eth burned equals less eth available to be sold on the market by miners, making the already existing eth more valuable.