FCAM

Decentralised Digital Investing

# Ethereum - Re-affirming the Bull Case

July 2022

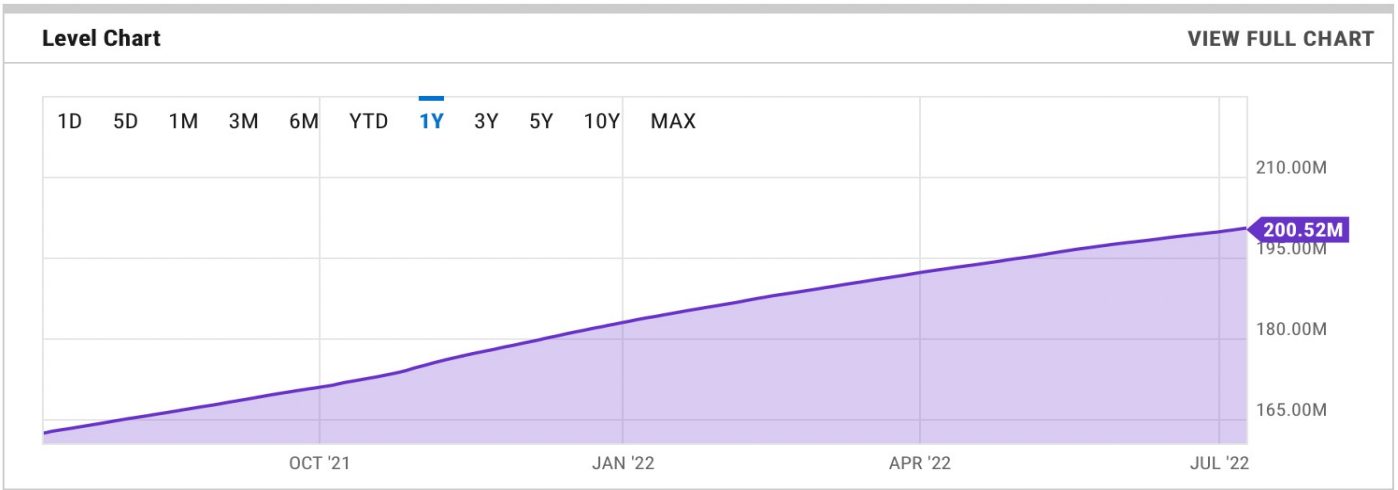
# ETH: RE-AFFIRMING THE BULL CASE

"The truth will set you free, but not until it's finished with you" – D. Foster Wallace

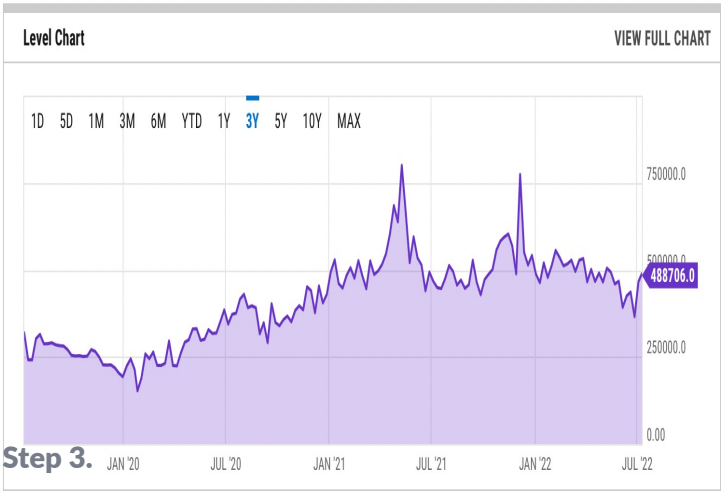
The last few quarters have tested many a portfolio and many a hypothesis as to what truly reflects value, price as always is determined by demand and supply for an asset, currently we have little of the former and plenty of the latter. With inflation a continued threat and the tailwinds of low rates now behind us projects that are long on promise and short on deliverables will continue to be exposed. With this in mind, we thought it was time to revisit our analysis of the Ethereum Network to understand whether the premise we held pre the price collapse still held. We have long advocated that there is substantial alpha available in the blockchain, digital asset and DeFi space but that it was very early in its evolution, hence our general conservatism. Time is on our side and considered decisions are what is required. Being engaged in the space and generating sustainable returns in projects that have business models in which we can see the upside has been the mantra that we have adopted at FCAM.

Our first foray into owning Digital Assets outside of DeFi was Ethereum, the platform that everything we owned was based. Looking back at our note of last September, we explained our rationale for owning the asset.We highlighted 4 metrics that we thought were indicative of adoption and progress.

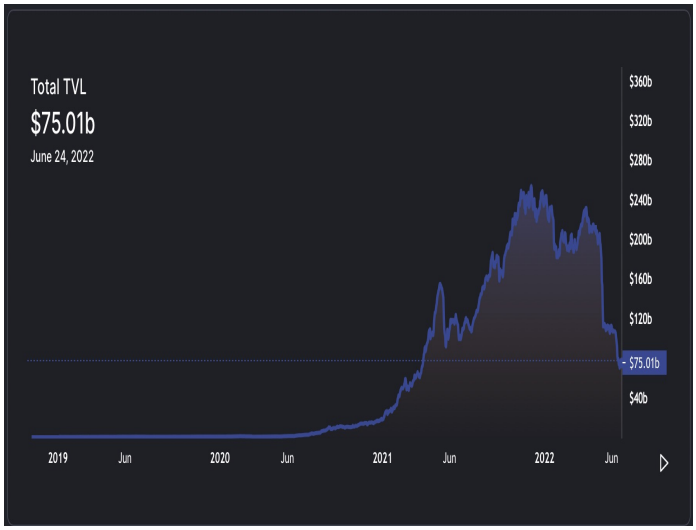
- Number of Ethereum addresses. As of last September we has 170m unique addresses, currently this number sits at 200m.This growth continues unabated regardless of the performance of the Asset. - *YCharts



- The Ethereum Daily Active Addresses data provides the daily number of unique addresses that were active on the network as a sender or receiver.– ie engagement with the network remains robust also. Peaking at close to 800k, it now has stabilized around 450-500k.The Ethereum Daily Active Addresses data provides the daily number of unique addresses that were active on the network as a sender or receiver. *Ycharts




**Step 3.**




- Daily number of transactions that a network verifies. Essentially static in terms of growth. Gas costs remain a problem to true scalability. We flagged that resolution is likely being driven through moving to Proof of Stake that is expected later this year. The evolution of Roll-ups, calculations off chain, only to be moved and batched on chain may make this measure not a true reflection of activity. That said we are early days when it comes to Roll-ups but we expect in due course this part of the ecosystem to allow true scale. *Ycharts

- Value of digital assets being used as collateral on the network as measured by Total Value Locked (TVL). TVL reflects the value of digital Assets held on chain, there has been a precipitous drop driven by the collapse of value of digital asset values. Given that the value of many assets have declined by more than 50% the value declining to $75bn is not to be unexpected. Equally money has left the ecosystem, again not a surprise.
*DeFI Llama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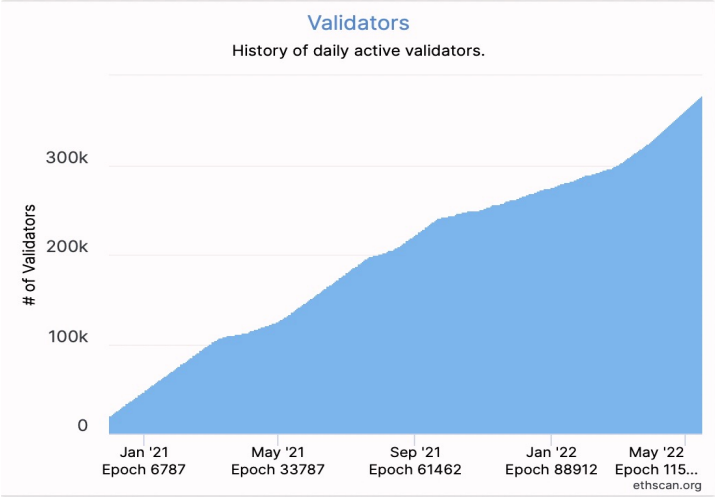
- Number of validators. With over 300,000 validators now on the ETH 2.0 Testnet, each of whom have staked (deposited) ETH into the network, are verifying transactions. Adoption and verification of transactions on th ETH network and the 2.0 upgrade remains on a positive trajectory. *DeFi Llama




Our thesis back in September was that we saw utility and value in DeFi. The major DeFi protocols have been built to run on the Ethereum blockchain and as such there was value in the Ethereum ecosystem. The use case since then has expanded to NFT's with platforms such as Opensea becoming the largest user of the Etheruem network. The progress has been notable, however there are still some nagging criticisms of ETH have been centered around a few key issues.

- It's an inflationary asset – This is a criticism of many digital assets, the reward for staking or validating comes from the issuance of tokens. This increased supply is often a natural selling pressure. Miners need to pay for infrastructure and this increased supply in bearish markets exacerbates this selling pressure.

- Environmental issues – Mining using ASIC's rigs for proof of work does have an environmental impact. There is an extremely valid argument that mining can be used as part of a strategy to move to a more stable, cheaper and environmentally forward strategy, but that's perhaps for another note.

- Cost and Speed – ETH has been a victim of it's owns success. From DeFi summer to the exponential growth in NFT issuance and trading, usage has grown dramatically. This usage has exposed some significant challenges to truly scaling. Just this month Yuga labs, the creator of the Bored Ape Yacht club, sold "land" in the metaverse project called "The other Side." The launch netted over $400 million in sales for Yuga Labs, however It also generated an unprecedented $100 million in Ethereum gas fees in just under an hour.

Managing growth is always a challenge. Managing growth on a protocol with an exponential level of adoption and use cases which are are only limited by human ingenuity and imagination is a challenge on another level. Developments by the Ethereum foundation have been mapped, as they are with any technology project, and there have been numerous delays, again as there are with any technology project.

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While some aspects of the development can be run in parallel others need to be delivered sequentially. Some of developments while executed already, such as EIP 1559, won't yield their full potential without future developments, while others such as Roll-ups, sit adjunct to the ETH network and are yet to be widely adopted or fully deployed. The largest piece of work under development, that we will deal with shortly, is the movement to Proof of Work, while promised initially in 2017, the scale of the project is monumental as is the transformation that the protocol will undergo when complete. What we will address now are the three main criticisms leveled at ETH and the prognosis for the to be addressed in the near term.

**From Inflation to Deflation:**

It seems like a lifetime ago, but EIP 1559 was deployed late last year. The upgrade completely overhauled the fee market making the fees paid more stable and improving the user experience of paying for the network's block space. Importantly also EIP-1559 introduced a burning mechanism. A portion of transaction fees paid to miners or validators, will be removed from circulation forever. Anytime the network is used, ETH is burned, this is beneficial to the value of ETH as an asset.

The main purpose of the change was actually improving usability and predictability of fees paid by users, dampening the volatility of fees in times of high usage. Fees were split into two component parts, the first is what's known as the "base fee", which varies on a per-block basis depending on its utilization. The second is the "priority fee," which is a user-determined tip for miners to provide an incentive for them to include the transaction, almost like a tip to get to the front of the queue. The base fee is what gets burned, the more transactions there are the higher burn rate.

In summary according to Watch The Burn, since the EIP-1559 launch issuance has been reduced by over 60%. While currently still inflationary there has been analysis that when we move to Proof Of Work (which we will deal with shortly) the issuance could actually turn deflationary. This remains an outlier case however an asset that instead of inflating at 3.5% (which is what it does currently) to an asset that inflates at 1-2%, with periods potentially of deflation, given the current inflationary backdrop, and world of negative real rates is still a value proposition. As long as the utility and yield (which we will deal with shortly) exceed this 1-2% "cost" it's an attractive investment.

**Proof of Stake**

As we have outlined previously we think that the move from Proof of Work to Proof of Stake is the pivotal moment for the Ethereum network. Like all technology projects the timeline has dragged, Ethereum co-founder Vitalik Buterin has confirmed that the blockchain network will complete its switch to proof of stake this summer. He is famous for his conservatism when it comes to pushing the protocol, unlike the creators and promoters of many other blockchains he is a moderating voice. At the ETH Shanghai Web 3.0 Developer Summit, he indicated that the Merge is "very close to happening." This is likely by September at the latest he indicated.

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To recap on what the change is and what it means. Right now, we have a Proof of Work system. That is a transaction is confirmed by multiple high-powered computers backed by extensive infrastructure in a computational race using large amounts of energy. This race to solve the problem is how the network is secured, that is the competition from multiple unrelated entities ensures that the information in the block being confirmed is valid. There is a valid argument that Proof of Work can play significant role in using energy that is currently wasted (i.e., produced but not consumed due to lack of demand) however the solution of Proof Of Stake changes the narrative of a race entirely on its head.

In a proof of Stake model, you put an asset at risk, in this case Ethereum. The proof is no longer a race that requires hardware and wasted energy, rather it's a random selection of multiple potential validators (nodes) that run the calculation to provide the proof. They get paid the rewards that a miner would, however the fact that they have something staked means that if they act nefariously and validate something they shouldn't then they will have that stake jeopardized. Currently that sits at 32 ETH tokens.

The Ethereum network is transitioning to a Proof-of-Stake system in an effort to reduce its energy consumption, estimates are that it reduces energy usage by 95%. Equally the transition to this mechanism also introduces yield opportunities. Currently the yields is around 4.4% for your 32 staked ETH tokens. The return is variable based on activity, the estimates of yields upon completion of the merge vary from 2-20%.

We identified that ETH does have an inflationary issuance profile, so as long as the yield exceeds the issuance the attractiveness of reinvesting increases. Equally we flagged that the infrastructure required by someone running a staked ETH node as opposed to a proof of work is vastly different, hence the selling pressure to sell ETH to run your infrastructure is equally reduced.

**In Summary**

- ETH moves to become a token used to pay for transactions (demand)
- Its issuance is constrained through burning (reduced supply)
- The selling pressure to pay for infrastructure is diminished (supply)
- ETH earned or owned can be reinvested in the network to generate a yield that exceeds the inflationary issuance (Return on an Asset)

The energy efficiency and yield benefits associated with Proof-of-Stake consensus mechanisms have led to an increase in their popularity, which is a trend that may continue or accelerate as institutional investors enter the space and seek avenues toward profits.

**The speed vs cost conundrum..**

Blockchains like any verification process are not immune from compromise. One of the challenges that Blockchains are dealing with is the conflict between speed, costs and centralization referred to as the Scalability Trilemma.

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This Trilemma is the trade-off between decentralization and centralization and its impact on scalability. Decentralization slows the process of confirmation but increases the immutability of the transaction and the trust you can have in it and centralization the reverse. There is a broad range of blockchains across the spectrum. From BTC where the value proposition is that there is a limited number of tokens being issued and that the verification process is fully decentralised and can be trusted. However the processing time subsequently is currently sitting at 4.6 transactions a second. Compare this to the Solana Network where the hardware required is expensive and complicated to run and accordingly centralised to a few providers. However it can process 3,000 Transactions per second.

So in summary the more nodes you have, the more decentralized and secure your blockchain will be, however it takes longer and uses more energy for all of them to reach a consensus, hindering scalability. The corollary is that increasing scalability and centralization means cutting into the security, as you have to do more validation more quickly, subsequently security will suffer.

Ethereum as you can see from the table below is relatively slow and while moving to ETH 2.0 increases that Transaction per second to an estimated 100,000 transactions per second its still not going to be fast enough to compete with centralised infrastructure.

The Ethereum solution to the scalability challenge is what's referred to as sharding. It's a process used in Computer Science and is a process of splitting a database horizontally to spread the load. In a blockchain context this is storing part of the data off chain and calling on that data only when required. Post the merge and estimated to be sometime in 2023 Ethereum will adopt sharding. These shards will provide Ethereum with more capacity to store and access data but will not be used for the execution of code. Shard chains will provide extra, cheaper storage layers for applications and rollups to store data.

| | Internet Computer | Ethereum | Polkadot | Cardano | Solana | Binance Smart Chain | Zilliqa | Algorand | Avalanche |
|---|---|---|---|---|---|---|---|---|---|
| Average Block Time | 0.045 s (1 block) | 14 s (1 block) | 6 s (1 block) | 20 s (1 block) | 0.4 s (1 block) | 5 s (1 block) | 40 s (1 block) | 4.5 s (1 block) | 2 s (1 block) |
| Blocks per second | 22.5 | 0.07 | 0.17 | 0.05 | 2.5 | 0.2 | 0.02 | 0.22 | 0.5 |
| Finality | Web Speed (2 s) | 5 min | 60 s | 2 min | 13 s | 75 s | 2 min | 5 s | 3 s |
| TPS | No limit | 15 | 1,000 | 250 | 50,000 | 130 | 3,000 | 1,000 | 4,500 per subnet |
| Number of Validators | 233 | 6,833 | 297 | 2,376 | 1,027 | 21 | 12 | 100 | 1027 |

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Layer-2 solutions, or as they are also known, Rollups, are another process that will increase speed. We wil expand on this important developement in a future note however briefly they are already being used and developed, particularly in NFT projects. Simplistically, they are processes run off chain, before being consolidated into the final output and placed onchain. The completed transaction is "rolled up" into a single interaction with the Mainnet Ethereum. This process offers increased transactions per second and greatly improves user experience, and importantly reduces network congestion.

There is an extra layer of complexity of course to all this, the more moving parts in any process is a point of weakness. The deliberate and considered approach of the Ethereum foundation however fills us with confidence. As per the Tweet below, this process has been evolving for many years, and the combination of sharding and Rollups allows Ethereum to truly scale.


**So in Summary**

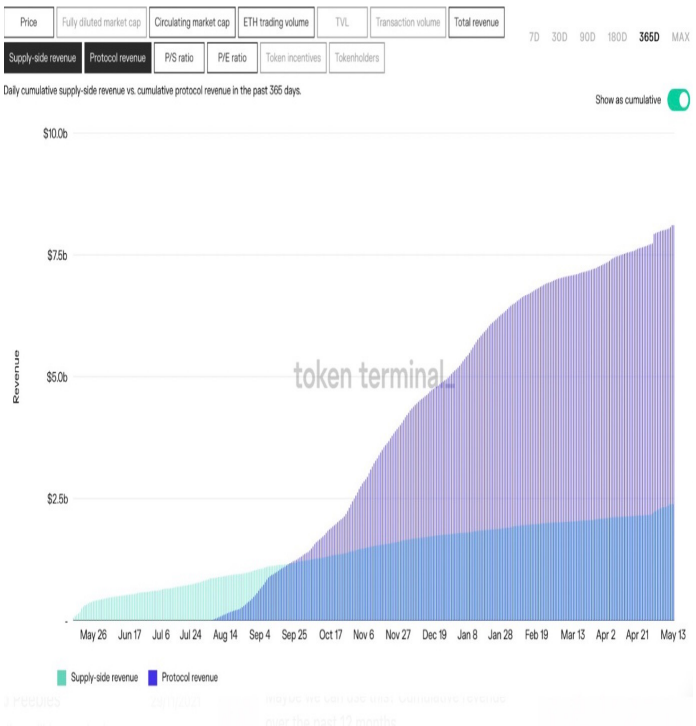
- ETH moves to Proof of Stake reduces energy consumption by in excess of 95%.
- As the usage of Blockchains to confirm transactions and interactions accelerates its clearly also a far more environmentally friendly process than centralized databases.
- Speed and cost clearly improve when we move to Proof of work, that accelerates further with delivery of sharding in addition to the Layer 2 rollups that are concurrently being delivered.
- The one issue still unresolved is that these developments are promised and not delivered. From all that the developers indicate on their fortnightly public calls is that the Proof of Stake upgrade is due August. There is a test net that is being running concurrently and problems being dealt with as they arise. These issues are diminishing weekly and most seem to resolved quickly such as the "re-org" problem of last month – read here – In a nutshell it was a problem that was identified and resolved on the beacon which is why its been run in parallel to battle test.

**The value proposition of Holding tokens**

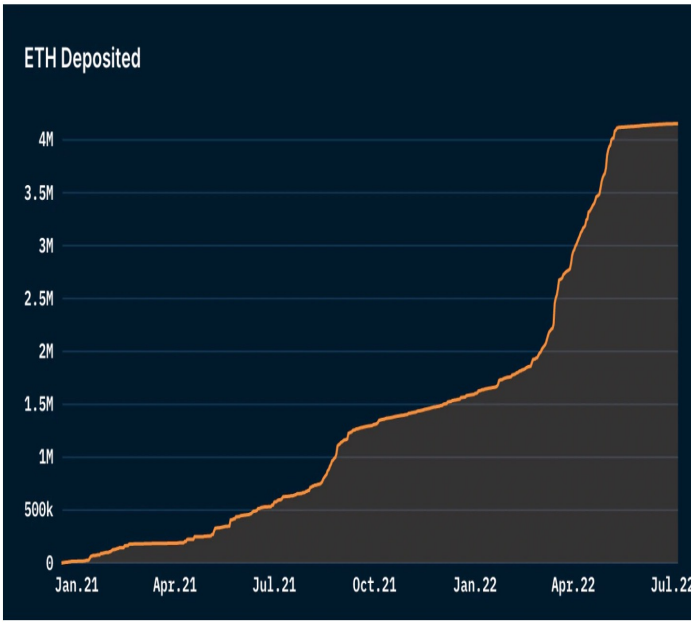
- Store of value proposition - BTC with its limited supply, bearer ownership and ease of transfer is the best known and most widely owned. We see ETH having the potential to rival BTC in terms of a store of value with its dramatically diminished inflationary issuance, natural demand

- Broadly tokens are a currency of their economy – what they are worth is driven by the following key parameters. The level of adoption of the protocol and use cases that are being applied on it. The revenue that is being generated less the cost of the protocol. In the chart below we highlight the revenues that are currently being generated on the Protocol. The current "cost" of the Ethereum protocol is the inflationary issuance of the token to encourage participation, with a move to PoS that activity reduces the cost through the burning mechanism.

- Natural Sellers and buyers – The process of Proof of Work is expensive, and miners are natural sellers of ETH to fund their business expenses. Moving to PoS the costs fall to become minimal and furthermore staking tokens that you have earned generates income.




The chart below reflects the amount of ETH staked on the Beacon Chain ahead of the network's upcoming transition from Proof Of Work (PoW) to Proof Of Stake (PoS). This ETH is currently locked up and unable to be sold, the dramatic rise in ETH Staked (+116%) indicates a confidence in the move to PoS and equally the view that the yield will be a positive risk vs reward. Roughly 10.86% of the total supply of ETH was staked by the end of Q2.




ETH Deposited on the Beacon Chain - Source: Nansen

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The last few months have been tumultuous is all markets and Digital Assets have been no exception. Many other projects funded by Venture Capital Money have suffered greatly as the Digital Asset tokens are often the only liquid asset in their venture investors portfolio. The true underlying value of projects can remain suppressed for an extended period with this overhang of supply. Ethereum, unlike these projects hasn't been funded by VC money. So, while ETH has been sold down with the rest of the digital asset complex, as it delivers progress, its more likely to be recognized in the asset price.

No endeavour runs in a vacuum. The macro backdrop matters as does momentum, regulation and adoption of a network. Ethereum's vision hasn't been fully realized and its use case is yet to fully developed however what we do know is that the innovation that it potentially releases can be limitless. We believe in the long-term value of ETH driven by demand of humanity to innovate, to continue to drive for efficiencies but equally to release the value of human interactions. These are broad and ambitious goals that we believe are not fully recognized in the value of ETH. While the macro headwinds and the echoes of the Luna and centralized finance failures and their contagion work their way through the ecosystem, and look likely to persist in the near term, we believe that the upcoming merge is a catalyst likely to refocus investors and developers on the scale of the opportunity. Capital accrues to quality projects. In a bear market, projects that have demonstrable value and solid fundamentals continue to see development. ETH remains the platform of choice where we believe the premium projects will gravitate and we remain constructive on the role that we expect it to play in the medium term.

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