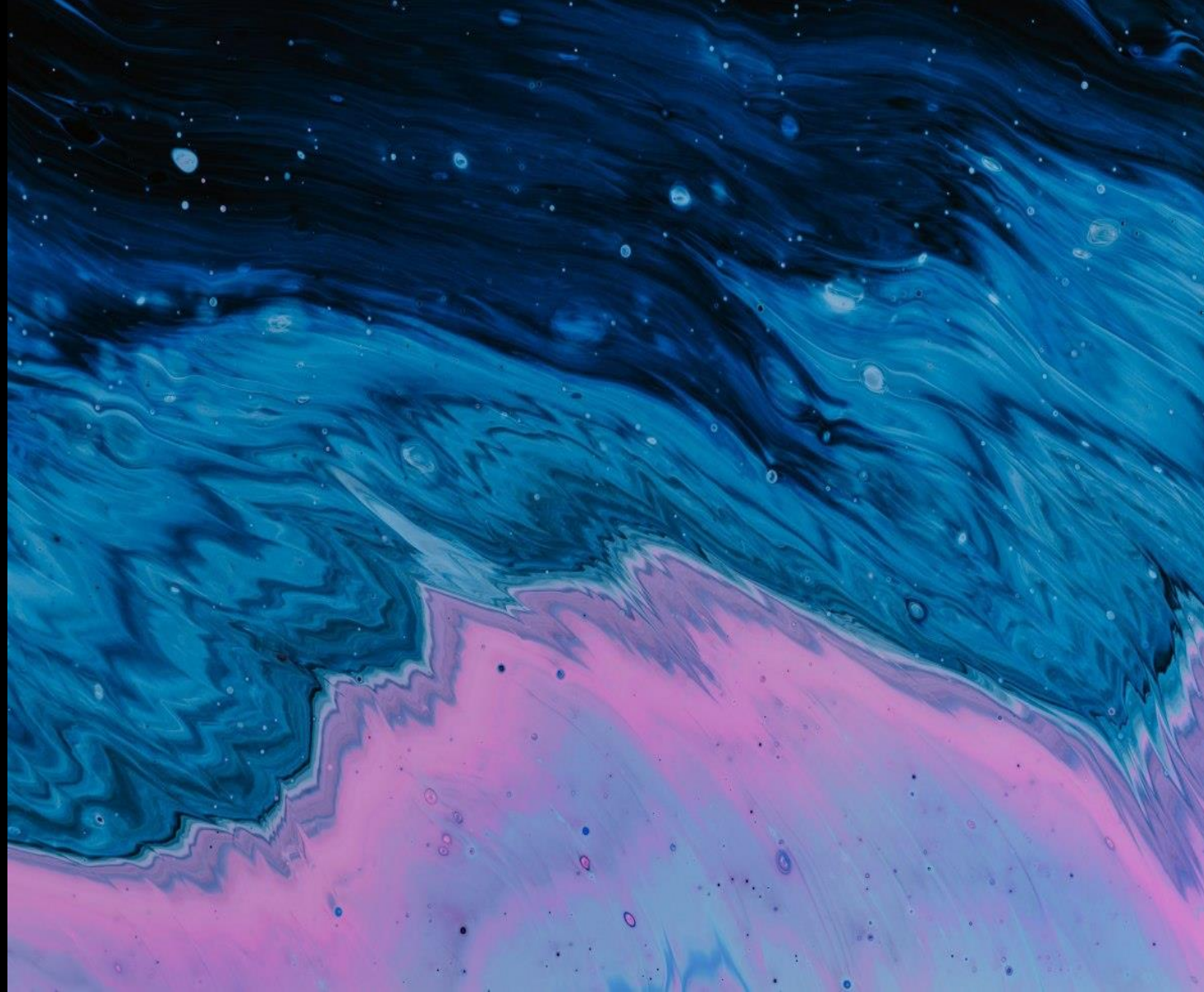
JULY 2020

The State of Ethereum

INAUGURAL MONTHLY ETHEREUM REPORT

DELPHI DIGITAL



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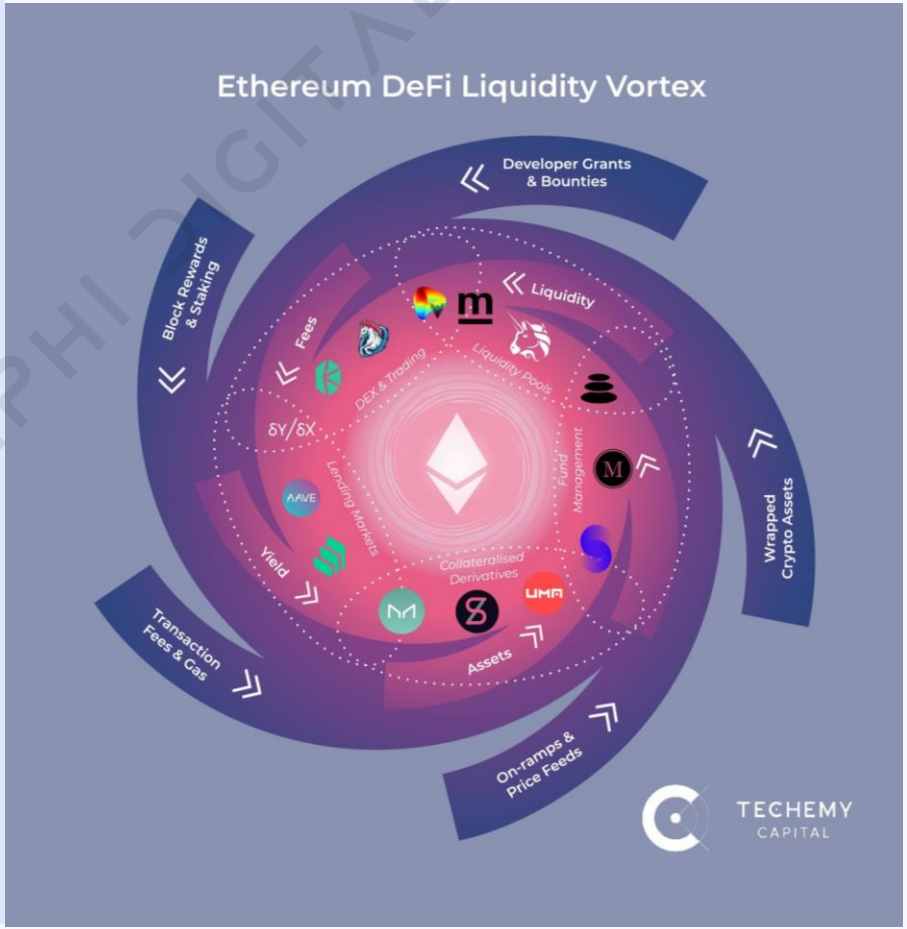
Executive Summary

As we enter the back half of the year, the Ethereum ecosystem is riding momentum on the back of flourishing DeFi usage once again which in turn has led to strong performance by DeFi app tokens. Ethereum network utilization remains high despite two increases in the gas fee limit and query protocols like The Graph crashed once from overwhelming demand from dApps with query volume growing from 25m to 45m queries/day.

So what's driving the growth? A big factor is yield farming which is rolling out across various protocols on the back of Compound's success, enabling users to earn a share in the protocol for usage. DEX liquidity is improving and YTD volumes of $8.6b YTD are already up 260% from last year's total of $2.4b. Total stablecoins marketcap is up 117% YTD to $12.5b with $8.5b (68%) of stablecoins live on Ethereum. A flurry of Layer 2s are launching in timely fashion given network congestion. Ethereum's network fees have surpassed Bitcoin's fees for 51+ straight days.

It took a while but ETH is finally getting in on the price action. After many years, Phase 0 of ETH 2 is expected to launch in Q4'20 and the transition to PoS has triggered interest given the high staking yields at launch to incentivize users to become validators (bootstrap consensus). We look at how the staking market is shaping up and potential concerns with exchange centralization. In ETH2, the value capture narrative for ETH becomes stronger as it becomes a productive capital asset with cash flows from staking as a validator to secure the network. If implemented, EIP 1559 will lead to deflationary pressures via burn as transaction volume from network activity scales, impacting the net issuance.

With the frenzy in DeFi, we evaluate incentives in ETH staking yields vs. DeFi yield farming . The opportunity cost of capital is another consideration given time horizon risk of staked ETH which can't be withdrawn until Phase 2. Will the staking yield incentives be high enough to encourage participation to secure the network? As a $36 billion asset compared to a growing DeFi ecosystem with $3.8 billion TVL, ETH PoS has potential for large materiality. The Beacon chain will have the capabilities to support 10s of thousands of validators, more than any other PoS protocol. The window of opportunity remains open for layer 1s but is closing with time as ETH 2 addresses throughput concerns and the dev mindshare strengthens.



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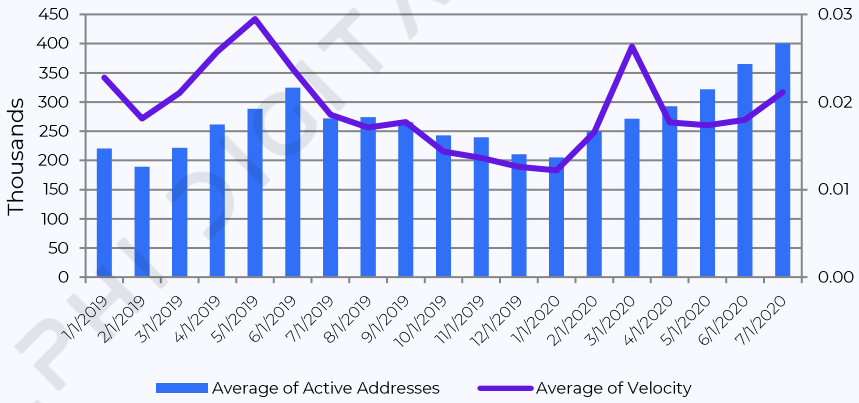
Sources: Techemy Capital

Network & Market Stats (1 of 2)

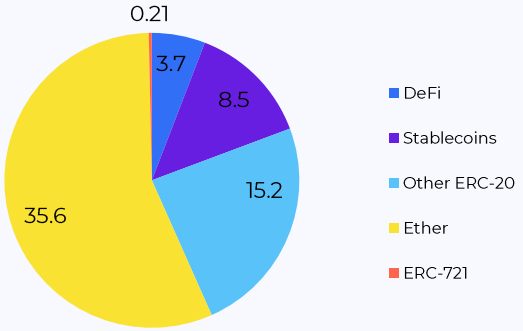
- An increase in velocity signals that Ether is used more often in day to day transactions and typically represents healthy network activity, much of which is coming from an increase in overall dApp usage and pursuit of yield opportunities with DeFi protocols.
- According to Santiment, ETH daily active addresses recently spiked to a 2 year single day high of 486k addresses, highest since May 5th, 2018. A caveat to note is that a portion of this may be attributed to the recent split of PlusToken funds (scam) into over 6k addresses. Per Nansen, Plus token wallets hold 793k ETH ($188m).
- **As of July 27th, Ethereum transaction counts have reached 29.5m MTD, the 2nd highest figure since Jan. '18 when ETH was at an ATH and 32.7m transactions were completed.**

Ethereum: Active Addresses and Velocity



- The fat protocol thesis put out in 2016 isn't holding up too strong at the moment as **the value secured by Ethereum of non-ETH denominated tokens briefly passed ETH itself, prior to this recent run up in ETH .**
- However, ETH continues to be the reserve asset for DeFi since it's the most trust-minimized asset in the ecosystem with now over 4m ETH locked in DeFi.
- Led by Tether, stablecoins' market cap has more than doubled in half a year. **The usage of stablecoins as money relative to ETH, has increased substantially.**
- While it's difficult to estimate the size of the ERC-721 market, historical volume all-time in USD just passed $100 million and market cap as of EOY '19 was ~$210 million. OpenSea, a marketplace for NFTs, recently reached 200k total users since launch.

Value Secured by Ethereum (Billions)

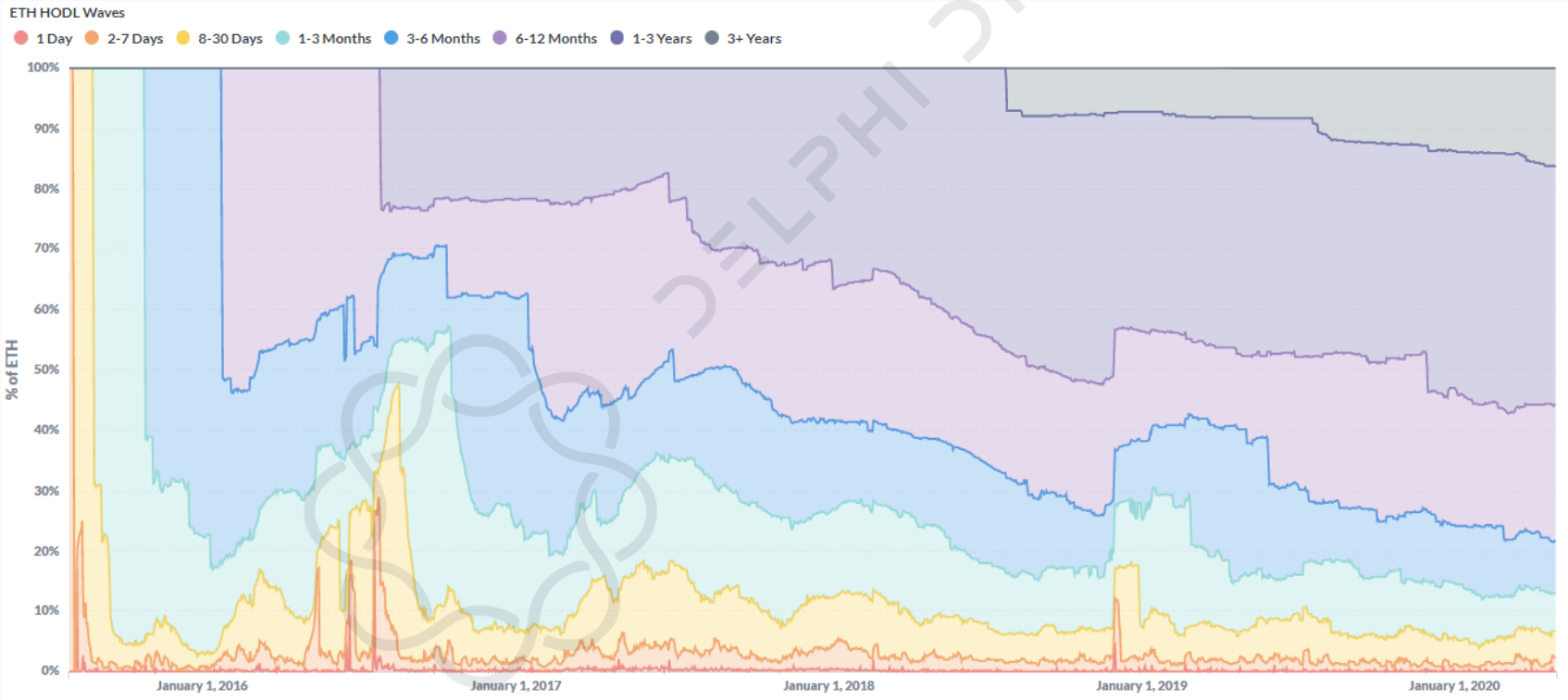


Nonfungible's EOY 2019 report revealed a $210m NFT market cap

Sources: Santiment, NonFungible, Messari, Ren, USD on Ethereum, Etherscan, Glassnode

Network & Market Stats (2 of 2)

- Active supply age bands (HODL waves) indicate in the time period denoted, the % of ETH that was last moved on-chain (Excluding smart contracts). **Around 58% of the supply hasn't moved in 1+ years.**
- There's been a prolonged miner accumulation of > 21k ETH following short term selloffs in late May and early June. This signifies higher confidence levels in short term price performance of ETH as ETH mining pools chose to sit on block rewards for the month of June.

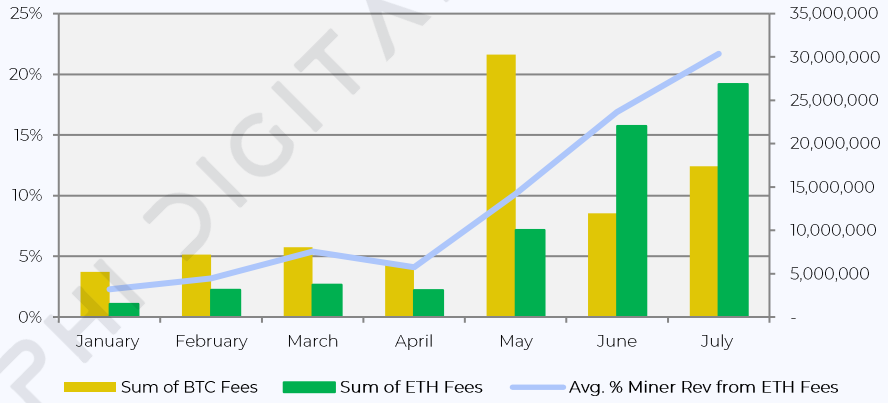


Sources: Nansen , Glassnode , OurNetwork - Santiment

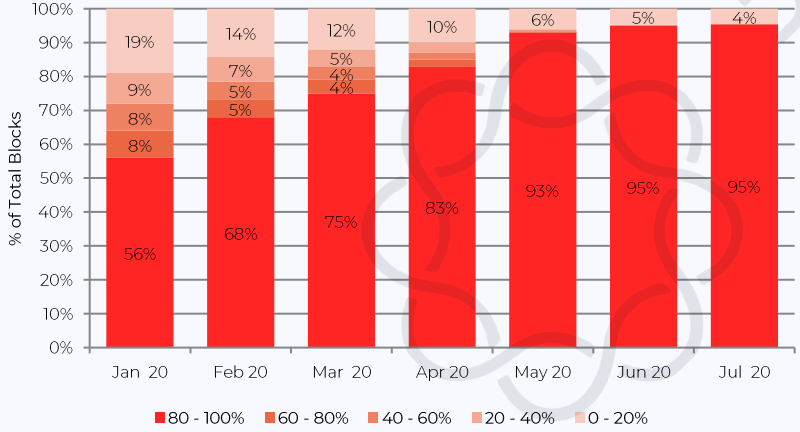
Gas & Fees

- **Over the past few weeks, Ethereum miners have voted up the gas limit not once but twice, effectively increasing the throughput of Ethereum but also increasing the chain size, which can make it more difficult to sync a full node** and a higher limit makes it more susceptible to computationally intensive attacks. Miners can now process more transactions per block w/o impacting gas prices user are paying. However, raising the limit hasn't helped much partially due to "Induced demand".
- **Ethereum daily transaction fees have now surpassed Bitcoin fees for 51+ straight days, totalling $47m vs. $26m in this run.** Sustained higher fees bode well for long run sustainability.
- As a result, % miner revenue from fees has ticked up and the key question becomes how long can these fees be sustained by users willing to absorb the premium costs? **High fees benefits whales and may discourage network participation from smaller users**

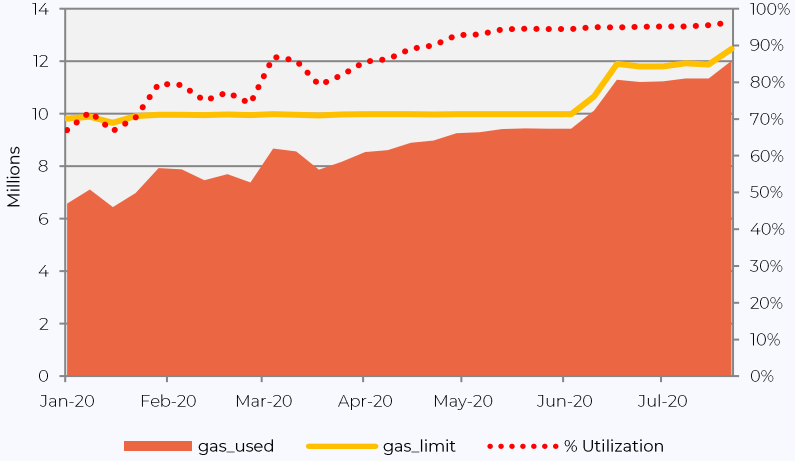
ETH vs. BTC Total Fees by Month (USD)



Block Gas Utilization Trend



Gas Usage vs. Max Gas Possible



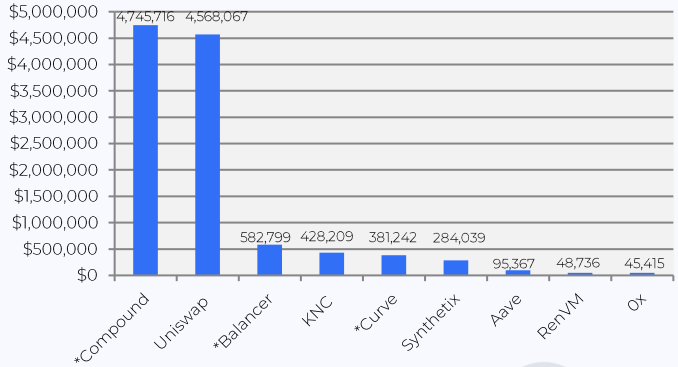
Sources: Glassnode, Etherchain, Coinmetrics, Siddarth Jain

DeFi Overview

A note to stagnant projects in the top 20, objects in the mirror are closer than they appear. DeFi is on a tear. Although project valuations getting frothy, they at least reflect increased adoption of working products. **Total value locked in DeFi (USD) is up a staggering 440% YTD from $700m to $3.78b.** TVL is not an end all be all metric but portrays the magnitude of capital inflows. Increased DEX usage in the dApp ecosystem, liquidity mining on DEXs, and yield farming on lending protocols are all contributing to the growth.

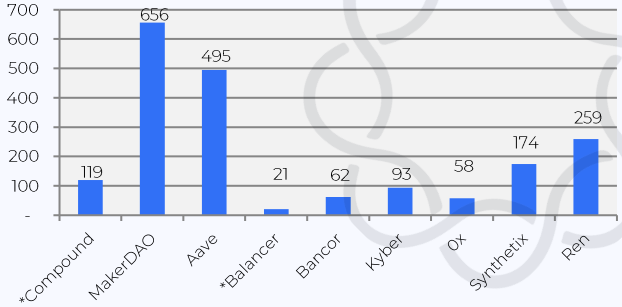
The beauty of DeFi protocols is that in contrast to traditional finance where there's a big reliance on 10-Qs which can lead to earnings surprises on the upside/downside, these protocols have transparency in on-chain cash flows and user growth is assessed in real time. DeFi sector revenues are paltry at large compared to valuations, but there's meaningful traction compared to other areas in crypto, with one of the most lucrative being the competitive DEX space.

Protocol Fees Generated in USD (Last 30D)



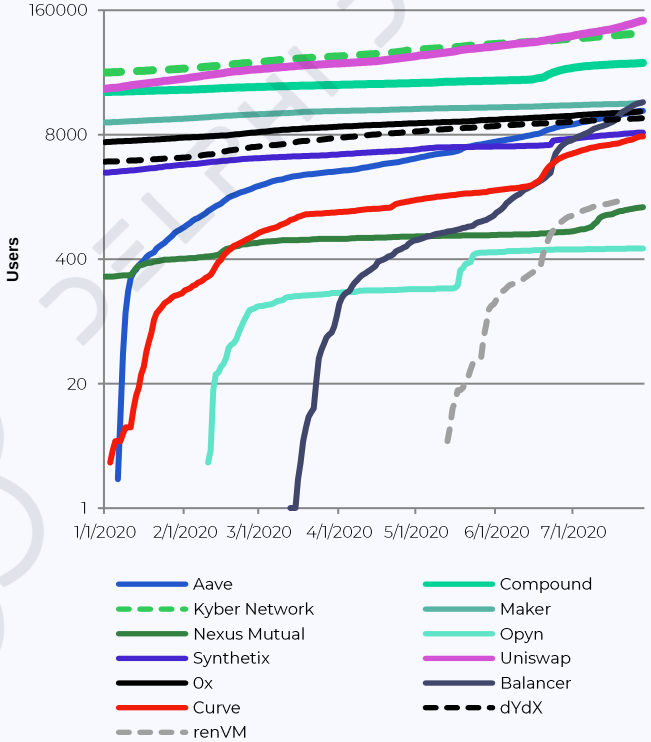
**Denotes offering of liquidity mining program*
Curve number does not capture deposit/withdrawal fees

P/E Ratios Across Top Assets



P/E ratio calc. off Marketcap as of 7/29 divided by avg. of annualized earnings in Q2 - July 25th

DeFi Users Over Time



Project	User Growth (%)	Users Over Time
Balancer	864%	17,180
renVM	659%	1,693
Curve	246%	7,644
Aave	94%	14,160
Nexus Mutual	92%	1,388
Uniswap	74%	123,639
Compound	51%	44,857
Synthetix	39%	8,445
Kyber Network	26%	91,954
0x	19%	13,944
dYdX	17%	11,856
Maker	10%	17,125
Opyn	6%	517

User Growth is from June to July

- Balancer, Compound, and Curve to name a few have all seen strong user growth from incentivized liquidity mining programs.
- A second order effect of yield farming has been the surge in demand for smart contract cover on the newer protocols. Nexus Mutual has been a direct beneficiary. Yield aggregators have seen increased usage as well.

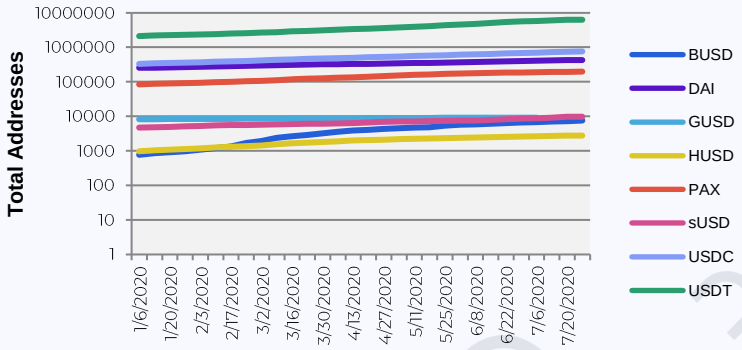
Sources: Token Terminal, Dune Analytics, Curve, Ren, Synthetix, Aave, Dune - Protocol Earnings

Stablecoins

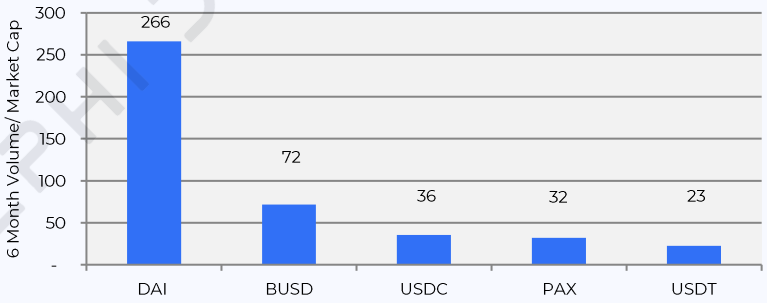
Stablecoin markets have seen explosive growth and increased use as MoE, led by Tether which has 85% of the market share. Although USDT lives on multiple blockchains, Ethereum accounts for >88% of USDT transaction volume. Tether is the most used ERC-20 on Ethereum accounting for >16% of Ethereum transaction value. **$8.5 billion in stablecoins is now secured on Ethereum.** On the topic of fee abstraction risk , it'll be interesting to monitor the growth of custodial stablecoins vs. ETH-backed stablecoins.

As Tether is a centralized asset embraced by the decentralized finance community it's important to cautious. However, as the saying goes, liquidity begets liquidity, and this is one of the primary reasons Tether is so popular. As evidenced by the on-chain volume / MC multiple, despite DAI's small supply given issuance is dependent on CDPs, usage remains high whereas Tether has lower velocity perhaps attributed to use for one time transactions and storage of digital dollars. Yield farming recently has also triggered a large demand for DAI.

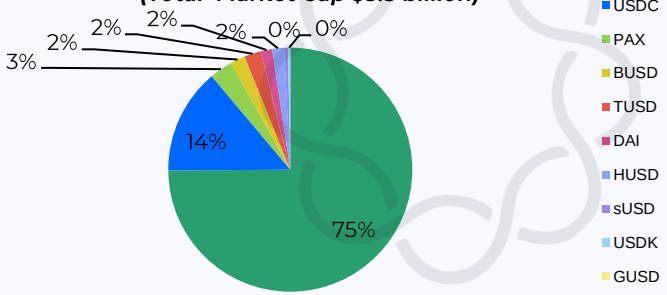
Total Stablecoin Addresses Used



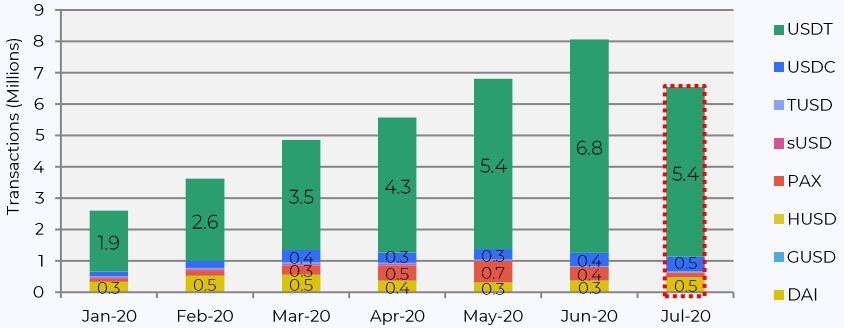
On-chain Volume / Market Cap Multiple



Top 10 Stablecoins on Ethereum (Total Market Cap $8.5 billion)



Stablecoin Monthly Transactions



Sources: State of Stablecoins Q2 2020, Blocknative From stablecoins to dollars , USD On Ethereum , Nansen

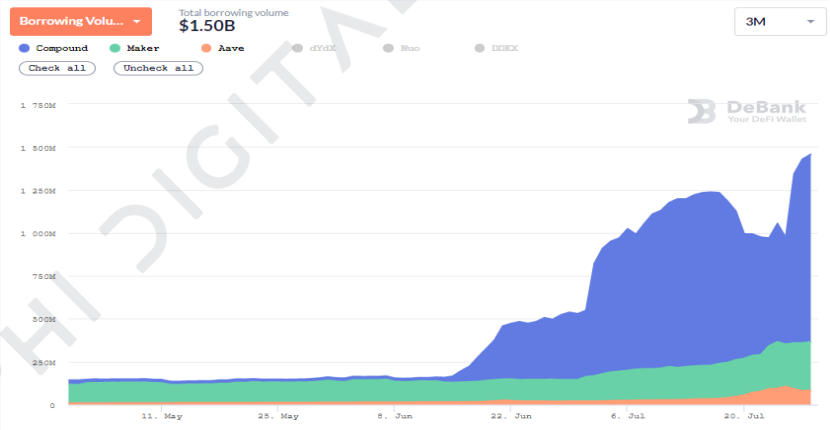
Lending Protocols

Yield farming is essentially putting idle assets to work. **This is a superior model to the legacy ICO as it encourages usage and distributes ownership to active participants.** For protocols, rewarding LPs bootstrap the network. Compound kicked off the yield farming frenzy by decentralizing it's protocol and distributing 42% of COMP governance tokens to users over the next four years. Users aka "farmers" are now depositing assets to lending protocols like Compound to capture a share of COMP tokens and earn interest in the native deposit asset.

Given the macro backdrop, crypto lending has received additional spotlight given attractive rates compared to traditional savings accounts earning 1.05% APY. As DeFi is permissionless, loans are primarily over-collateralized and the fluidity of variable interest rates presents plenty of opportunities to pursue the best yields. Since the deleveraging in March, demand for borrowing has picked up again.

Total funds borrowed and supplied (i.e. liquidity) for DAI markets on dYdX, Compound and Aave. Periods where utilization was between 80% and 90% are highlighted in salmon, while utilization higher than 90% is shaded in red.

Total Borrowing Volume Across Top 3 Protocols: $1.5B



There is $2.26 billion in value locked across 10 lending protocols, accounting for 630% YTD growth.

Project	Value of Outstanding Loans	MCP / TVL Ratio	Number of Users over Time	User Growth M/M %
Compound	$1,134,741,390	0.43	44,857	15%
Aave	$83,911,866	0.91	14,160	41%
Maker	$282,650,204	0.50	17,125	6%

Note: MCP/TVL Ratio can be quite fluid given yield chasing

Aave has seen strong YTD growth and is rolling out an impressive array of products ranging from flash loans to rate switching from fixed to variable and vice versa, alongside integrating 16+ collateral types. Notably, Uniswap LP tokens where LPs can also earn interest on UNI tokens. Aave recently announced it's Aavenomics, an upgrade to the token econ and plan to decentralization for sustainability of the network.

Sources: DeBank DeFi Pulse DeFi Protocols for Loanable Funds

DEXs

DEX volume growth is outpacing that of centralized exchange volumes but zooming out it barely registers on the radar with market-share in the low single digit %s. **Compared to CeFi exchanges and exchange tokens like BNB at $2.9bn, DEX products are growing faster at lower market caps.** The value proposition for using DEXs and respective tokens has been strengthened by the increasing number of dApps which source liquidity from them. **As UX improves and liquidity deepens, DEX aggregators like 1inch benefit from being able to source the best market prices** and use Gas token for fees.

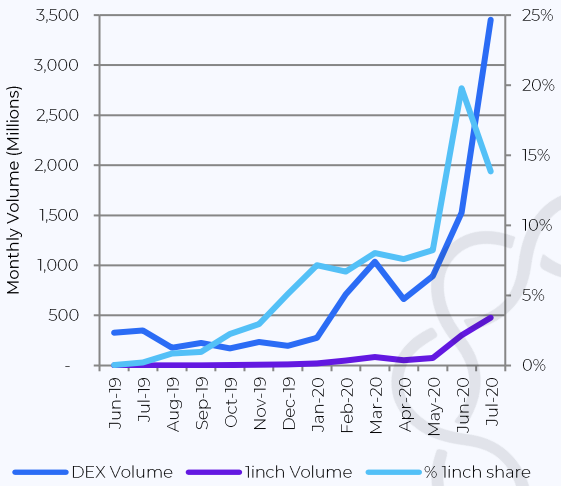
On top of this, revamping of protocol upgrades is occurring across most of the tokens. (Example: Kyber, Loopring, 0x). Constantly high gas fees are a concern but it's worth keeping an eye on Layer 2 DEXs to see if they can accommodate some of the load by processing trades off-chain, aggregating and then submitting on-chain a proof of their validity. High gas fees are not going away any time soon and may push users to L2.

Key Growth Driver: Liquidity Mining Incentive Programs drove a lot of volume on DEXs (Balancer, Curve).

DEX Project	% Growth (Jan to July)
Uniswap	2011%
Curve*	1607%
Bancor	1489%
dYdX	638%
0x	636%
Kyber	264%
Balancer**	247%

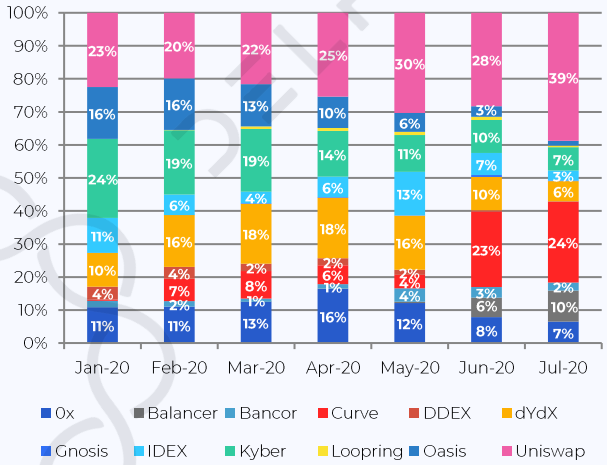
Req. of Min. Monthly Volume of $50m
*Curve: Feb to June data
**Balancer: June to July data

1inch Volume to DEX Volume (Monthly)



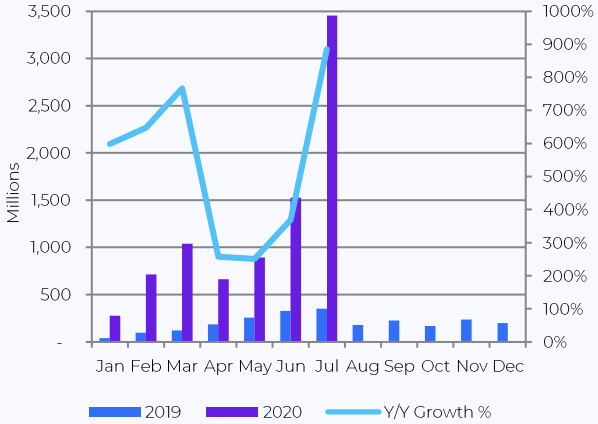
Close to 15% of DEX volume is being facilitated through 1inch.

DEX Market Share YTD



Uniswap at $1.4bn and Curve at $840m have dominated in July. **As depicted, AMMs continue to flourish and increase market share.**

Monthly DEX Volume YoY Growth



2020 YTD volume of ~$8.6b is already 188% greater than all of 2019 $2.4b

Sources: Dune Analytics - DEX Metrics , Dune Analytics - 1inch Exchange

Derivatives

Synthetix – Synthetix has been express shipping as usual. SIP-53 introduced parimutuel markets for binary options which have $380k across 36 active binary options markets. Synthetix Foundation has been decommissioned and is now under the control of 3 distinct DAOs. Synthetix will also power Dhedge, a non-custodial mimetic trading platform for synthetix assets.

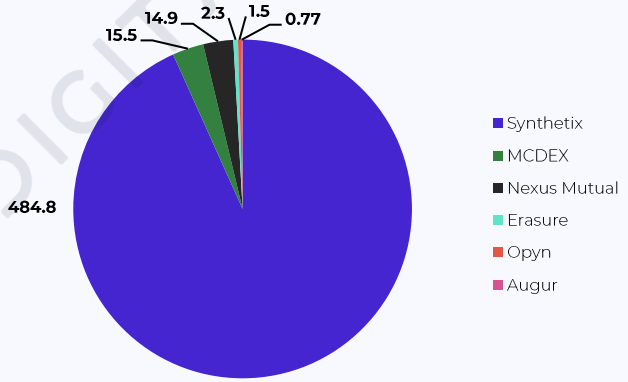
Opyn – Opyn continues to grow out it's product line with the addition of BAL and COMP put options for farming protection. **Total notional volume since launch has now reached $48.9m with the largest driver being $43m coming from ETH put and call options**.

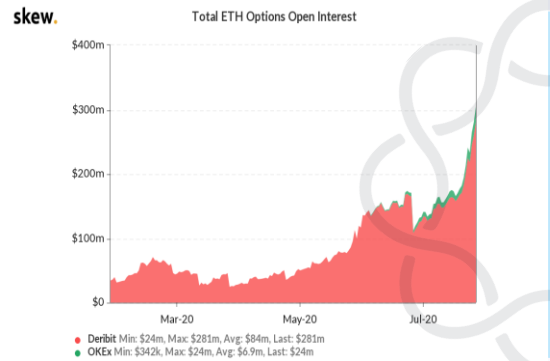
Nexus Mutual – **Since yield farming drives lots of capital to untested smart contracts, the high demand for covers surpassed the underwriting capacity of the mutual.** Nexus adjusted it's capital scaling model to allow for more cover capacity. MTD active covers have grown from $5m to $15.3m.

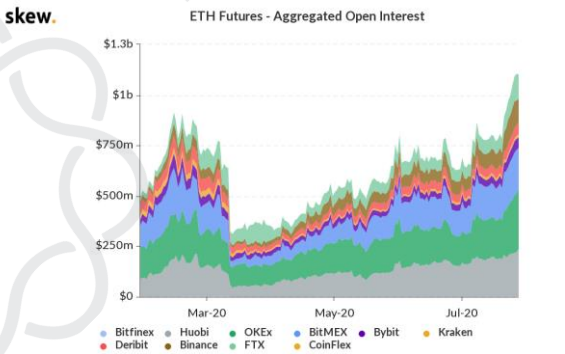
UMA Protocol – UMA's new liquidity mining program incentivizes LPs to bootstrap liquidity for its new synthetic yield dollar token, yUSD, by adding to the respective Balancer pools. $13m in ETH has been locked in UMA thus far.

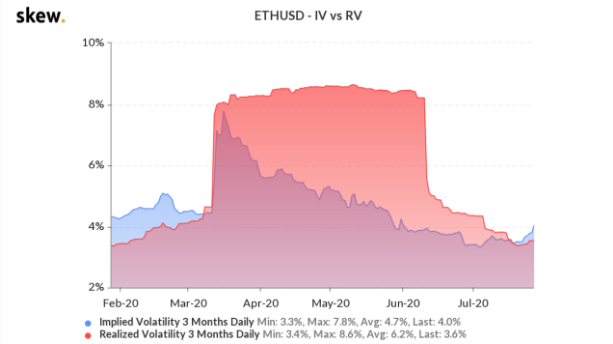
Derivatives Markets - After a long period of muted volatility, realized volatility has now passed implied volatility. ETH options open interest is skyrocketing particularly on December dated contracts (ETH 2 catalyst?) and aggregated open interest on ETH futures has also recovered since March 12th.

Derivatives: Value Locked in Millions (USD)









Sources: Skew , DeFi Pulse, Dune Analytics - Opyn, Nexus Mutual

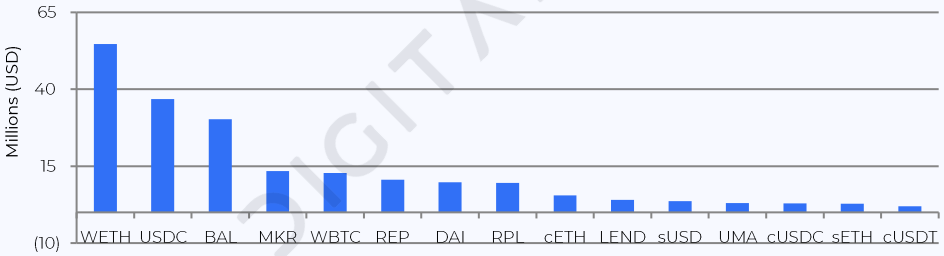
Apps on Ethereum – DeFi Update (1 of 2)

Balancer, an AMM that allows users to generate liquidity pools made of ERC-20 tokens, introduced it's liquidity mining campaign, with 145k BAL distributed to LPs weekly (> $1.5m), attracting traders to park assets in Balancer. It goes after the long tail of assets (66 unique so far).

The problem is that Balancer has incentivized depositing any assets, leading to many assets with little trading demand. Governance discussions have been busy to say the least with proposals going into play that effectively adjust the BAL rewards factor based on the type of pairs in the pools.

Despite a number of early issues such as FTX gaming the rewards system and the STA token drain, Balancer has been an in-demand destination for the flow of capital and other projects are deploying liquidity mining programs on top of it.

Balancer: Top 15 Assets By Liquidity



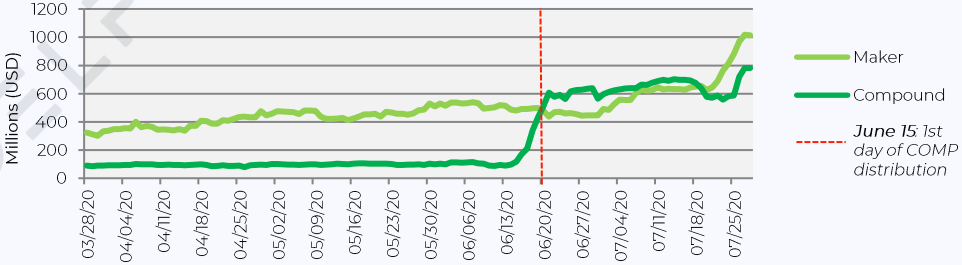
Top 15 assets make up 91% of total liquidity. 66 unique assets in pools.

Compound kicked off the yield farming frenzy with it's COMP distribution subsidizing borrowing that in turn leads to better deposit rates (50/50 COMP distribution to lenders/borrowers).

The big picture theme here has been that anything that can be gamed will be gamed. **Asset agnostic farmers simply pursued the assets that yielded the most COMP (based on interest rate model), resulting in a distortion of the markets**.

In a 2 week period, users increased by 8k and TVL increased > 5x. As COMP is purely a governance token, in order to better capture value long term, governance should vote in a change for COMP holders to capture protocol fees.

Total Value Locked (USD): Compound vs. Maker

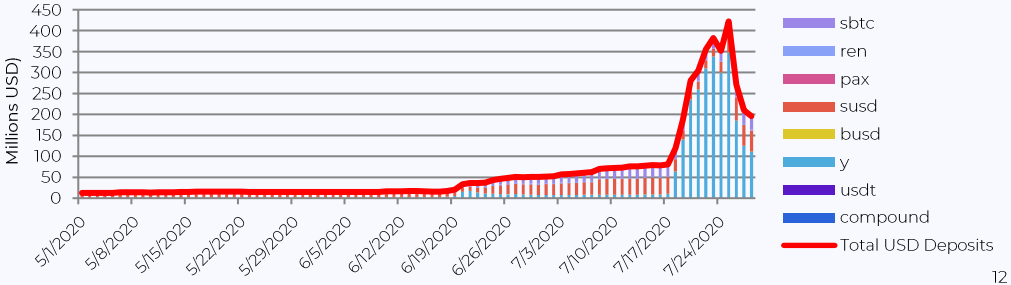


By focusing on stable assets like stablecoins, Curve has found product market fit and offers deep liquidity that rivals that of centralized exchanges. The minimal slippage on large trades is attractive for arb trading as well.

On the right, you can see how quickly capital flows, with the recent dip due to the YFI incentives in one of the pools drying up.

sBTC pool offering SNX, REN, and CRV incentives has also lured in yield farmers (Info). CRV will be issued retroactively to LPs in proportion to interest earned since the start. The early design of the upcoming Curve DAO can be found here. **Trading fees will be used to buy and burn CRV. 3% of fully diluted cap will go to pre-DAO LPs. 58% of fully diluted cap goes to post-DAO-launch LPs via inflation.**

Total USD Deposits in Curve: $326, 136,029



Sources: Dune Analytics – Matteo Leibowitz, DeFi Pulse Dune Analytics – Curve, Twitter Curve LPs

Apps on Ethereum – DeFi Update (2 of 2)

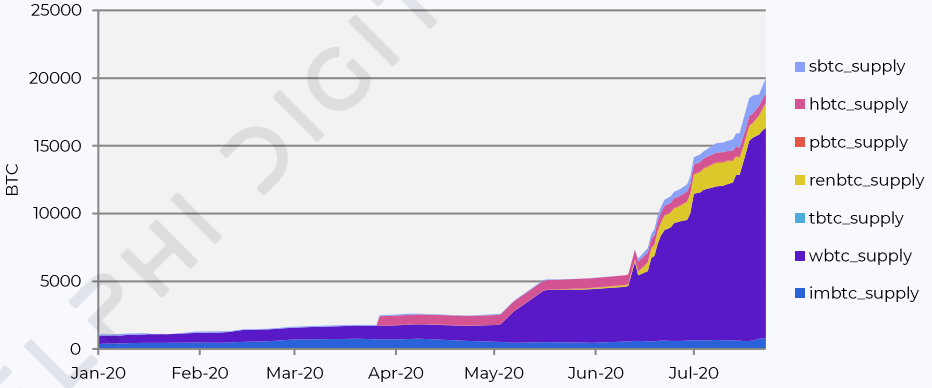
Growth of BTC on Ethereum led by wBTC

Although $218m in BTC on Ethereum only represents 0.1% of BTC's market cap, the M/M growth rate of 81% signifies a genuine demand to access DeFi with BTC and should not be overlooked.

Despite being custodial and the friction involved in minting wBTC, it now has 78% market share with 24% of wBTC being used as collateral in MakerDAO and $45.6m wBTC is deposited on Compound. renBTC is also quickly gaining traction thanks to non-stop ecosystem integrations.

Short term, this doesn't hurt the BTC thesis of being a SoV and settlement layer. A majority of BTC volume already is on CEXs, and DeFi is simply another venue with higher fees and higher utility. **Long term at a larger scale, it could have a negative effect on Bitcoin's security as transaction fees migrate and are absorbed by another blockchain.** Key factors to watch: How much utility tokenized BTC adds, trustless/trusted spectrum, and scope of yield opportunities.

Total BTC On Ethereum
$218,072,055



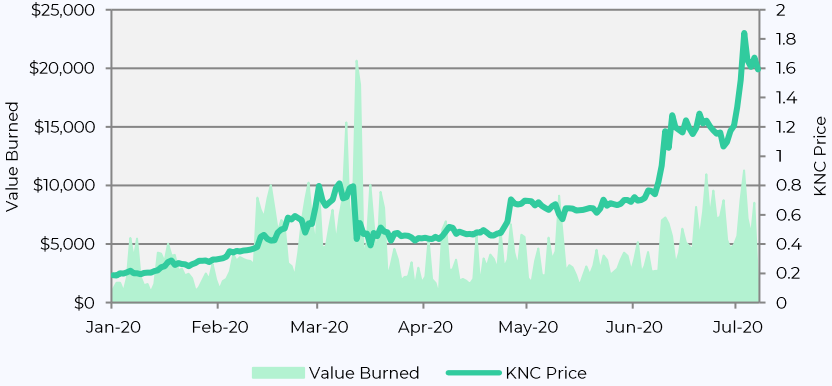
Kyber's Katalyst

Leading up to Katalyst (token econ change) and transition to KyberDAO on July 7th, Kyber surpassed $1 billion in volume since mainnet launch. KNC was added as MCD collateral as well but the utilization of the 5m debt ceiling is low at 4.43%.

A worrisome trend is that Kyber is losing DEX market share YTD going from 24% in Jan. to 7% in July. Instead of voting to adjust the network fee parameters to direct more of the fees for reserve rebates as incentives, 78% of the KyberDAO community just voted in an increase of the % of network fees to stakers from 65% to 70%. In the current epoch, a vote to go back to lower staking fees is leading.

The recent network fee parameters voted in are **70% to staking, 25.7% to Reserve Rebates, and 4.3% Burn.**

KNC Price vs. Value Burned



Sources: BTC on Ethereum Coindesk Kyber

Grayscale Ethereum Investment Trust

Background

Grayscale offers traditional investment vehicles providing exposure to cryptocurrencies through brokerage accounts or 401k retirement accounts. Shares in the ETHE trust are available to institutional and accredited investors at fair price in primary market. **Retail investors are piling into ETHE shares at a premium on the secondary markets to get exposure through brokerage accounts & 401ks.** Taking a step back, Grayscale is in a great position as one of the leading asset management firms with more than $5.1bn total AUM, adding > $1b in July.

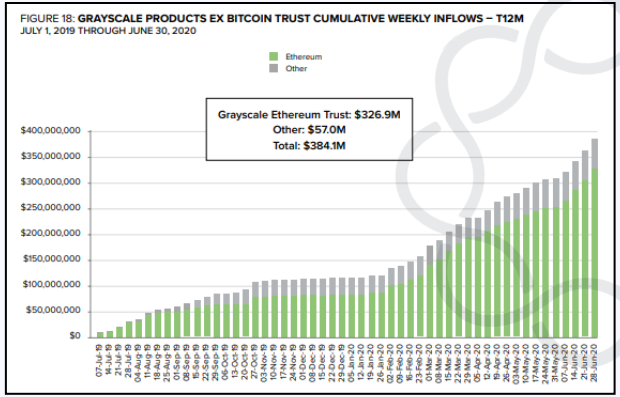
Dissecting the ETHE premium

Similar to how the GBTC trust has historically carried a premium, ever since FINRA approved the ETHE trust in May 2019 for retailers, it has seen significant inflows. **ETHE experienced record inflows of $135 million in Q2.** In Q1, 88% of inflows across Grayscale products came from institutional investors, dominated by hedge funds. Current AUM stands at $582m. Note that retail may be buying thinking they get a 1:1 match in ETH when it's really 0.093 ETH per share. ETHE has traded at a premium as high as 949% YTD and is now at 255% as of 7/29. The collapse of premiums is likely driven by predominantly hedge funds liquidating their holdings after the 12 month lock-up period for new placements expired (see bottom right). Float unlocking has depressed the premium, and crushed retail who likely didn't do due diligence. If the premium does remain high, arbitrage funds can sell ETHE on secondary markets and re-enter at NAV with spot ETH. Based on previous quarterly reports, it appears that $5-$10m in ETHE shares (NAV) will mature weekly in Q3.

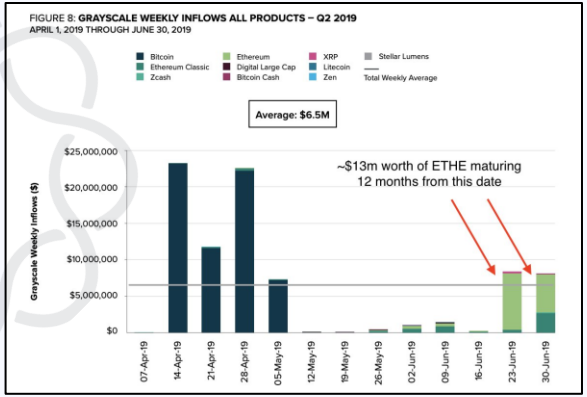
A Field Day for Funds. Bullish for ETH

Strong ETHE related borrow points to the notion that liquidity always make its way to the most productive use case, where liquidity generates the most return. Borrowed shares to create ETHE have to be returned and bought in spot market or trades can be rolled to sell ETHE, buy spot and create new ETHE shares.

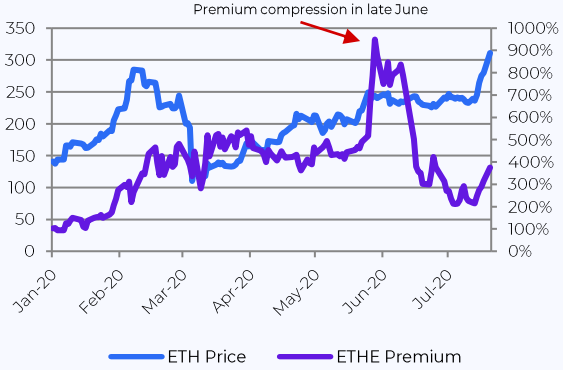
Record inflows of $135 million into ETHE in Q2 '20



Maturation of ETHE Shares from June '19



Grayscale Ethereum Trust Premium to NAV



Sources: Grayscale, Yahoo Finance YCharts CMS Nic Carter Grayscale Q2 Report

ETH 2.0 Timeline

The consensus goal is now Q4 for Phase 0 launch. Devs are backing up their words with 64% voting yes in a $140k prediction market that it will launch by EOY. There's an existing attack net running with bounties for breaking things. **The final testnet Medalla is expected to launch Aug. 4th** and will have a ~6-8 week public trial run. Mainnet launch date will be announced after. Danny Ryan mentioned the team will be closely listening to community demand for validator to validator transfers which are currently likely to be disabled until at least Phase 1. Withdrawals on deposits and rewards won't come until Phase 2. There is uncertainty around timing of full PoS plus sharding and completion may take longer than expected.

As our partner Tom put it, with Ethereum being the dominant smart contract platform, the window of opportunity for programmable competitors to gain market share is between now and viable Layer 2s. Longer term, the timing of the transition to ETH 2 plays a role as well given potential for delays.

Phase 0: The Beacon Chain	Controls Basic Staking Activity	The launch of the beacon chain will be the crux of the network, but will have limited functionality comprised of managing the proof-of-stake system. Functionality includes managing stakers and funds at stake, a random number generator to choose block producers and staking committees, voting on block proposals and granting rewards or penalties to stakers.	**Q4 2020**
Phase 1 Shard Chains	Implements Sharding For Higher Throughput	Phase 1 will implement sharding, (or parallel computing), to allow the network to compute across different shards to increase throughput. The system will launch with 65 shards (beacon chain is a shard plus 64 shards). Two way communication between all of the shards is the biggest technical lift in our opinion.	**2021**
Phase 1.5 Integration	Integration into ETH 2 consensus mechanism as a shard	Phase 1.5 is the point at which Ethereum and all of its apps fully migrate into Eth 2 and are integrated into the new proof of stake consensus mechanism with access to a scalable data layer.	**2022**
Phase 2: State Execution	Smart Contracts Reintroduced	In the final phase of ETH 2.0, real activity is set to be unleashed including complex smart contracts. State execution is brought to the shards. This phase still needs a lot of development activity to near completion and specifications are not set in stone.	**Late 2022 - 2023**

Note: These are all estimated timeframes and are subject to change.

Sources: Bitmex CodeFi, Danny Ryan: State of ETH 2, ETH 2 Research Team AMA

Ethereum Recent Updates

Date	Item	Description
05/21/2019	Alterneath	Proposed hard fork of Ethereum to test ideas.
12/16/2019	Open Ethereum Client	Parity stepped away and handed off the Parity Ethereum Client to a DAO
01/16/2020	ETH 1.5	Ethereum Researcher Danny Ryan stated the community are excited about Vitalik's ETH 1.0 to 2.0 transition idea
01/23/2020	ETH 2.0 Deposit Contract	Smart contract that accepts ETH1 and grants ETH 2 on beacon chain. Passed formal verification check.
3/03/2020	EIP2565 Proposed	Justin Drake stated the EIP's 10x gas reduction for certain activities can enable cryptographic primitives (RSA VDFs etc)
03/13/2020	EIP2593	EIP2593 was shared as an alternative (escalator algorithm) to EIP1559 to make a more efficient fee market.
03/31/2020	Phase 0 Audit Complete	Least Authority's audit of Phase 0's specs is complete. The audit covered DoS attacks, resources, forks and more.
04/17/2020	Berlin Upgrade	Developers discussed five EIPs (discussed on another slide) to include in Ethereum's June upgrade
04/25/2020	ProgPow	ProgPow has been implemented by clients but not activated. Some see it as a time sink given PoS is on the horizon.
04/27/2020	Multi-Testnet Client	Schlesi the multi-testnet client for ETH Phase 0 Launches.
05/06/2020	Bug Bounty Program	All bug bounty rewards were doubled to a maximum of $20k for critical bugs
05/11/2020	Open Ethereum Alpha	Gnosis stated it would bring back the former Parity Client for Ethereum and maintain it.
06/14/2020	Multi-Client Testnet	Prysmatic Labs released the Onyx testnet, its second Beacon Chain protocol testnet. targeting v0.12.1 of the ETH 2.0 spec
06/17/2020	Staking Service	ConsenSys' CodeFi unit is launching a white-labeled professional validator for ETH 2.0.

Sources: Messari, Ethereum Blog, Coindesk, ETH 2.0 AMA on Reddit, GitHub

Transition from ETH 1.0 to ETH 2.0

Plan

- Migrate ETH 1 into a shard of ETH 2

Operational Benefits

- Expedited transition from ETH1 to ETH 2
- Removes PoW Chain
- Moves everything onto the Beacon Chain
- PoS faster, which means staking comes faster and more ETH locked up.
- Solves the issue of what the bridge will be.

Developer + Stakeholder Benefits

- "Eth1 living inside of eth2 allows for native access to the scalable sharded data layer. Some of the most exciting constructions being built on ethereum today are layer 2 protocols that scale with the amount of data available to layer 1."
- Eliminates PoW which cuts down on issuance
- Integrating ETH 1.0 into ETH 2.0 cuts down the amount of moving parts and ensures the entire community of developers and stakeholders have a vision for a single cohesive vision.

Prerequisites

- Stateless client software (a "pure function" for verifying blocks+witnesses, along with a method for generating witnesses for a block) available with multiple implementations
- Eth1-side protocol changes to bound witness sizes to ~1-2 MB
- Happens after phase 1.0 takes place
- Validators that want to participate in the eth1 system can register themselves as eth1-friendly validators, and would be expected to maintain an eth1 full node in addition to their beacon node. The eth1 full node would download all blocks on shard 0 and maintain an updated full eth1 state.

DELPHI DIGITAL

Sources: Vitalik Buterin, Danny Ryan

Beacon Chain Phase 0

Introduction

Phase 0, the Beacon Chain, is the core of the new consensus mechanism. **As the "conductor" of the Ethereum 2.0 network, it provides the tempo and rhythm for the system's harmony and consensus**. The engineering complexities in this phase come from the need to be able to distribute subsets of many validators across shards in phase 1 and beyond. Phase 0 will have limited functionality to start. Eth 1 chain will live uninterrupted with no changes, BAU for users and dApps.

Main Responsibilities of Beacon Chain

- Stores and manages registry of validators and their stakes
- Nominating the chosen block proposer for each shard
- Organizing validators into committees
- Applying the consensus rules
- Applying rewards and penalties to validators
- Being an anchor point on which shards register their states

Process of Onboarding Validators

Beacon Chain is the means of entering the staking system and earning passive income on staked ether. At the onset of Phase 0, users make a one-way ETH transaction to a deposit contract on Ethereum 1.0 so they can claim and stake an equivalent amount of ETH 2 tokens on the Beacon Chain. Validator activation depends on 3 conditions: **1)** the required activation balance of 524,288 ETH is reached, **2)** the Beacon Chain processes the deposit receipts, and **3)** it completes the queuing process.

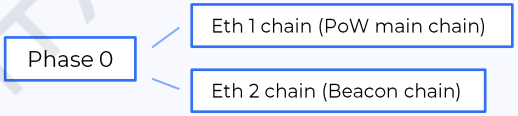
What happens to staked Eth?

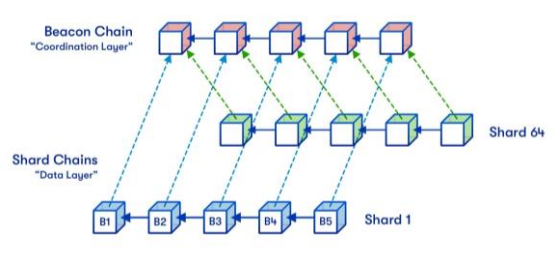
The ETH sent to the deposit contract on Eth 1 is basically a long term lock. Transfers between validators are disabled until at least Phase 1. Validators will have to wait until Phase 2 to be able to withdraw to a specific shard. Upon the integration of Ethereum under the Eth 2 consensus, the staked Eth will be unlocked, providing liquidity and fungibility across the system. With ETH locked, it'll be easier for devs to coordinate in case of an adverse situation compared to once transfers are live. Regarding sell pressure once 2 way bridge is ready, there will be a validator queue that adjusts dynamically based on how many people are withdrawing.

What makes Phase 0 special?

As described by Danny Ryan, Phase 0 is primarily about coming to consensus with capacity for hundreds of thousands of consensus entities aka validators, distributed across thousands of nodes globally. Not only does it provide the scaffolding for the rest of the system, but compared to other PoS networks also will have by far the greatest # of validators (~16k minimum) to start with capacity for many more

Two Active Chains Running in Parallel
With their own state and inflation





A slot is a chance for a block to be added to the Beacon Chain and shards. Each slot is 12 seconds and an epoch is 32 slots (6.4 minutes). Think of the Beacon Chain and shard chains as choreographed in lockstep. Every 12 seconds, one beacon (chain) block and 64 shard blocks are added when the system is running optimally.

Most of the time, validators vote on beacon chain and shard blocks but can also be pseudorandomly be selected as a block proposer to build a block and validators are responsible for also policing each other (Conflicting votes, propose multiple blocks)

Validators are executed by validator clients that make use of a beacon (chain) node. A beacon node has the functionality of following and reading the Beacon Chain. A validator client can implement beacon node functionality or make calls into beacon nodes. One validator client can execute one or more validators.

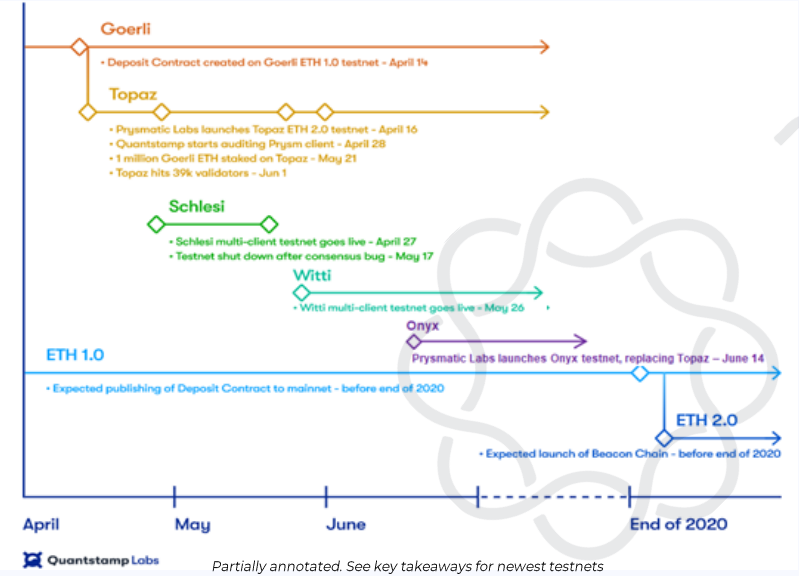
Sources: Ethos.Dev – Beacon Chain, Eth 2 Specs, Danny Ryan - State of Eth

Testnets and Client Progress

Key Takeaways

- Strong ETH 2 testnets demand so far is outweighing the number of active validators combined on both testnets and main-nets of competing PoS networks
- **The final multi-client testnet "Medalla" is set to launch August 4th with support for min. 4 clients**. It's built for and maintained by the community, rather than the previous testnets (Geared towards devs/clients)
- Prysmatic Labs launched the single client Onyx testnet on June 14th which uses the final spec (v0.12.1) which aims to be multi-client compatible. On June 29th , Altona, the dev-focused multi-client testnet, launched with Prysem, Teku (PegaSys), Lighthouse Sigma Prime) and Nimbus (Status). It replaces Witti.
- There's been a few deposit failures on testnets. As a remedy, the deposit contract has been converted from Vyper to Solidity and re-verified, due to concerns about the maturity of the Vyper compiler.

Timeline containing recent Phase 0 milestones



Partially annotated. See key takeaways for newest testnets

Benefits of Multi-Client Approach

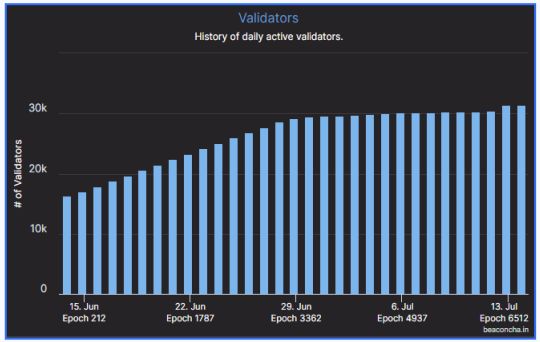
1. Different design goals lead to more diverse user-base and apps. Clients optimize for various aspects like performance, UI/UX, hardware (Like Nimbus client for smaller devices like mobile)

2. Reduces dependency and risk from a bug or attack one client from crippling network

3. Different programming languages used – Invites respective dev communities and fosters innovation in that language leading to better ecosystem tools

There are currently 8 different clients

Onyx Network



- Onyx has the same configuration parameters as mainnet except the usage of testnet ETH
- Onyx has 31,543 active validators and over 320 active peers on Onyx. (Newly launched Altona has 4,198 so far)
- Participation rate of validators attesting to blocks has slowly dropped from 90% to mid 75%

Sources: Onyx , Quantstamp , Beaconcha.in Beaconscan

Staking Market Options

There a number of ways to begin staking and earning passive income, ranging from running your own validator to 3rd party staking, each coming with tradeoffs. From the ConsenSys staking survey, we can see that the roughly 33% who plan to run their own validators are large holders of ETH, with sound understanding of Eth 2 economics, and the majority will participate in Phase 0 out the gate. Another 33% of holders, exhibit a base level understanding of Eth 2 economics, expect higher annualized net rewards, and tend to more frequently store ETH on exchanges in the first place. **Given the staking market size and lower barrier to entry compared to PoW mining thanks to cheaper entry prices as a validator compared to PoW mining, we expect no shortage of staking service offerings**. We will touch more on the opportunity cost of staking later in the report.

Where to stake ETH?

Run your own validator

Pros:
- Higher ROI
- Non-custodial
- Contribute to decentralization and network security

Cons:
- Technical skills/barrier to entry
- Maintenance costs
- Uptime requirements

- ETH 2 Launchpad has been created by Ethereum Foundation for ease of use
- DAppNode is a decentralized infrastructure for running nodes over Infura
- DIY Guide 1, 2, and Hardware
- Min. requirements for validator: 32 ETH, run validator node with Internet connection, have access to beacon node.

Centralized Staking Services
Examples: ConsenSys, Binance, Stake Fish

Pros:
- No min. qty. ETH to stake (Staking pool)
- No need to invest in hardware
- No need to run & maintain setup
- Customer support & onboarding

Cons:
- Custodial risks
- Rely on trusted counterparty
- Commission fees on rewards
- Higher potential for slashing risk (same client infra.)

- ConsenSys is spinning up a white-label staking as a service product in a Eth 2.0 pilot with Binance and others
- Validator voting power in the hands of centralized parties can lead to issues (See Steemit /Binance)
- Fees will vary (Bitcoin Suisse for example will charge 15% flat rate to start)

Non-Custodial Staking Services
- There are numerous offerings emerging like Attestant, Staked, Stakewise, Stake Capital, etc.
- The Bison Trails platform will make it easy to interact with the Beacon Chain, stake ETH, and automatically manage validators, validator clients, & beacon nodes

Liquid Staking Services
Example: Rocketpool

Pros:
- Node operators earn higher ROI than staking solo
- Min 16 ETH to stake
- Liquid staking (Tradeable rETH)
- Potential collateral for DeFi in form of rETH

Cons:
- Technical Risks/Unproven
- May not be ready in time for Phase 0
- rETH likely to trade at a discount to ETH
- Custodial at launch

- We highlighted Rocketpool due to it's unique position with liquid staking and potential for re-hypothecation of rETH into other DeFi protocols. Learn more about Rocketpool here
- The biggest takeaway here is better access to liquidity than other options. This may appeal to the short-mid term oriented crowd that wants more flexibility

Mitgating Risk: Technical Risk: **Nexus Mutual**, a discretionary mutual, can cover any smart contract on mainnet as long as there as there is enough staking of the native token NXM. Could be an option to consider for assurances with Beacon Chain and/or Rocketpool. Financial risk: Dedicated stakers will endure ebbs and flows of the market, and to alleviate price downside may be beneficial to hedge with put options (e.g. Opyn). Large exchanges could offer insurance for slashing events. Unslashed Finance is working on a product to cover slashing risk on any blockchain (Eth 2.0 included).

Sources: ConsenSys

Unsolved Issues and Latest Information

State Rent

Problem: Layer 1 chains like Ethereum face the problem of state growth, which describes how quickly the size of the blockchain is growing. Think of "state" as the segment of Ethereum data that node operators need to store. **In ETH 1, we see a tragedy of the commons problem, where a user pays a one-time fee and occupies long term with little incentive for users to clear state while full nodes bear the brunt by continuously storing disc space. The long term concern here is that this hurts decentralization, as with growth it becomes more difficult to independently run a node.**

Stateless Ethereum is a major R&D Effort to solve the state growth problem. The idea is for nodes and validators to be able to secure and validate the protocol without the need to store full state of each shard. In ETH 2, there will be light nodes, which can verify transactions/parts of state without actually holding state. ETH 2 introduces sharding. The scalability problem that Eth 1 faces is that every node has verify and execute every transaction**. In Eth 2, sharding essentially horizontally scales the network, by adding more nodes. Shard chains have only a subset of nodes processing it. Validators assigned to shards only process and validate transactions in that shard**. This is a big upgrade over the current setup where each full node stores the entire state of the blockchain and processes all the transactions. Ultimately, the existing Ethereum EVM shard (EVM or eWASM) and new shards will interact and communicate via the Beacon Chain.

Sharding Effect on Composability in DeFi

Composable money legos are what makes DeFi special and attract substantial economic activity. There are concerns of composabilty breaking with sharding in Eth 2. Haseeb from Dragonfly Capital introduces the notion that shards will start off as an open landscape with different cities and land segments utilizing different purposes. It's possible to start that much of DeFi may actually end up on the same shard that is high throughput and connected to liquidity pools. The higher expenses may be prohibitive but other shards will be occupied as well and would require cross-shard transactions. Since a lot of this we'd need to see in practice first, there is substantial execution risk in the first place.

Exchange Centralization under PoS

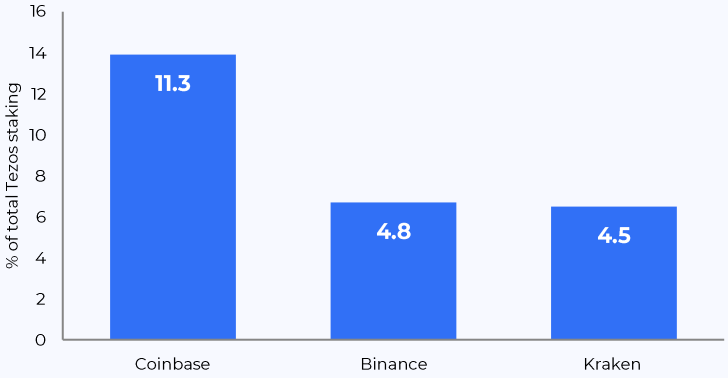
Although staking APY is attractive, it may be accessing the APY itself that bodes difficult for some, leading to market share going to 3rd parties that handle all the work. With popular PoS protocols like Tezos we can see a precedent of high staking centralization amongst top exchanges (~20%). This can reinforce the network effects of large exchanges, leading to validator centralization

Exchange Dominance: 16% of Ethereum supply is held on exchanges, up 34 % YoY.

With custodial staking, there's a risk of a single point of failure, where providers operating the same infrastructure for multiple clients raises potential concerns over simultaneous downtime. Nodes running in the cloud vs local servers is another risk, for example given dependency on AWS, there is risk of larger penalty loss.

To counter this, disincentives have been implemented to attempt to keep staking service providers from growing too large. **For nodes running on the same client infrastructure, validator penalties will be larger.**

% of Tezos Staked on Top Exchanges



Sources: Tezos Stats Glassnode

Impact of ETH 2.0 on Token Economics

Current Economics: Miners earn a fixed reward of 2 Eth from each block reward and a variable reward in the form of transaction fees paid to the network. Thanks to the growth of DeFi which relies largely on overcollateralization for trustlessness, there is now 4.1m Eth (~1.3bn) locked in dApps and growing. it's not yet a meaningful supply shock given that's only 3.6% of the liquid supply. **The dApps built on top of the Ethereum network are driving increasing fees leading to more scarce bandwidth, but are parasitic in that the on-chain value derived from activity does not increase fundamental value to ETH**.. For a platform wanting to become the global settlement layer, there are improvements needing to be made to tighten the value capture design of the reserve asset ETH to protocol growth. Network fees earned by miners eventually are sold back into the market, repeating the cycle. Tokens and smart contracts benefit from Ethereum's security but the majority of the benefits are paid for by ETH holders via inflation in the form of miner block rewards.

Looking Ahead: The change in consensus algorithms from Proof of Work to Proof of Stake in the Serenity upgrade, changes the economics as the **fixed block reward shifts to a variable issuance model, while the network fees component continues.** Compared to PoW, in PoS large scale validators only need to sell a smaller portion of rewards to pay for costs. They are incentivized to accumulate and compound rewards. Given the sliding issuance scale as a function of ETH staked by validators, there is opportunity to lock up a sizeable portion of the network, especially in the near term as ETH deposits will be only one way until ETH 1 integration into ETH 2. If EIP 1559 is approved and implemented into the protocol, a portion of the network fees from transactions will be burned. Assuming strong staking adoption and high transactions volumes accruing fees leading to more burn, on a long term basis the net issuance may even become deflationary. **Tying things together, EIP 1559 and staking a symbiotic relationship is formed where not only does increased usage drive value but the introduction of cash flows to a wider group of participants for securing the network creates a more effective long term value proposition.**

ETH 1

- Uncertain monetary policy (DAO hard fork, 2 hard forks to adjust block rewards).
- Programmability & composability great for dApps but in current token econ dApps are parasitic.
- Investment narrative does not resonate clearly within crypto sphere and at macro level.
- More fees from transaction activity than BTC but ETH remains just 18% of BTC market cap.

ETH 2

- PoS more economically feasible long term at scale.
- Enhanced monetary policy (Minimum issuance to secure the network).
- Transformation into a productive capital asset with underlying cash flow from staking.
- Burn transaction fees, deflationary. Reduction of the issuance rate over time.

Value Drivers of Ethereum

Trustless Collateral for DeFi
- Utility as reserve asset of Ethereum

Staking
- Return on capital

Fee Burn
- Usage drives value

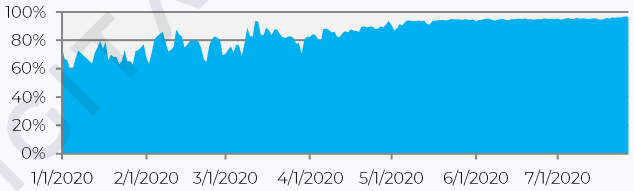
Gas Management – EIP-1559

Network Congestion: An important metric for assessing economic activity on Ethereum is total gas used also known as transaction fees. **Lately, Ethereum usage has been hitting all-time highs in large part due to increasing USDT transactions, DeFi applications with more complex transactions requiring more gas, and a number of scams**. Since the block gas limit set by miners is reaching high utilization, Tether has decided to also integrate into the OMG Network, a Layer 2 scaling solution that can help reduce transaction confirmation times and fees.

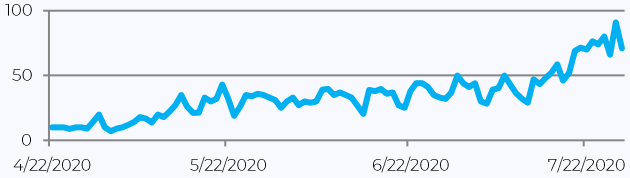
Problem with current system:

- **Simple auction mechanism to price fees leads inefficient bidding**
- 3rd party gas estimation sites show payments, benefitting miners who can select transactions ranked by highest fee
- During high network duress, variance increases further

Average Utilization of Ethereum Blocks



Median Gas Prices (Gwei)



Fixing the gas management problem can also directly improve Ethereum's monetary policy. The key questions are how can Ethereum better capture value from transaction fees, reduce UX pains, and still properly align miner incentives? Gas pricing must also be efficient under different conditions such as less than half full blocks, regularly half full, and full in times of severe congestion. It's important to create a healthy fee market that caters to all participants of the ecosystem. A possible solution heavily being considered is EIP 1559. **It's important to note that although EIP 1559 won't solve the network congestion problem, it will enhance the user experience and reduce unnecessary overpayments for transactions.**

EIP 1559	A moving base fee that is burned, with tips going to miners

Pros	Cons
• Burning fees creates deflationary pressure • Reduce transaction fee overpayment • Reduce complexity for wallets estimating fee to pay • Improves pricing efficiency over ETH 1 model	• Increases engineering overhead on all client and wallet devs • "tip" feature introduces significant complexities • Detaching fee from miner reward, removes incentive alignment between user urgency and miner selfishness

EIP 1559 **prevents economic abstraction** because BASEFEE is part of every transaction and denominated in ETH, and is **always burned**. It introduces an **elastic blocksize cap** where the existing hard cap on block size is replaced with a long term target of 10m gas per block and hard ceiling of 20m gas per block. The BASEFEE adj. mechanism makes transacting more or less expensive for users to target the desired level of blockspace utilization. 1559 makes the perpetual block subsidy a more flexible design option by acting as a deflationary force to coin issuance on the other end.

Status: Strong community support but if passed still large magnitude of change, we may not see it implemented by EOY. The EIP Gitcoin grant raised over $60k. There are ongoing discussions on how to implement aspects of the escalator fee as well. **The EIP 1559 testnet is set to launch soon and there are plans for a formal analysis of the EIP.**

Takeaways: Wrapping up, the implementation of EIP-1559 could be a long term positive catalyst but we have tempered expectations on the short term impact. Reason being, EIP-1559 at first will have a small initial impact on issuance, but this will scale with an increase in aggregate transactions processed on the Ethereum network. Over time as Ethereum matures, net issuance would continue to fall given the deflationary burn mechanism proposed**. The final switch to PoS to remove mining issuance is more impactful than burning.**

Sources: Etherchain, Deribit Analysis of EIP 1559, Medium - Eric Conner, eips.org EIP 1559, EthGasStation

Emergence of Layer 2 Solutions

Layer 2 scaling solutions are an important component on the Ethereum 2.0 roadmap , and we've recently seen the first implementations emerge that are designed to achieve faster transaction times and have lower fees, all without compromising security on Layer 1. **This is a timely arrival as an interim solution given the recent network congestion in Ethereum and can help bring scalability before the full mainnet implementation of ETH 2** Although L2s extend the functionality of Ethereum, they come with added complexities and can break composability . From May to June, avg. gas cost from a sample set to make a DEX trade, rose from $0.72 to $3.10. We are closely monitoring the rate of adoption of L2s to see if they can offload some of the demand from L1. Loopring and Ren recently collaborated to allow minting of renBTC with BTC from the Loopring Exchange UI via RenBridge integration.

Before we jump in, here's quick refresher on Zero-Knowledge Rollups, one of the promising options. ZK Rollups increase scalability through mass transfer processing in a single transaction. The two main users are transactors and relayers. Transactors create their transfer and then broadcast it to the network. Relayers are tasked with collecting large numbers of transfers to create a rollup. Their job is to generate a SNARK proof, which is the hash of the change (Delta) of the blockchain state and then report only the changes identified to the mainnet. This is done by relying on "before transfer" and "after transfer" snapshots of the blockchain.

Level 2 Scaling Solutions: Comparison Framework

	State	Sidechains[0]	Plasma	Optimistic	Validium	zkRollup
Examples	Pisa, Celer	Skale, POA	OMG, Matic	OVM, Fuel	StarkEx	zkSync, Loopring
Security						
Liveness assumption (e.g. watch-towers)	Yes	Bonded	Yes	Bonded	No	No
The mass exit assumption	No	No	Yes	No	No	No
Quorum of validators can freeze funds	No	Yes	No	No	Yes	No
Quorum of validators can confiscate funds	No	Yes	No	No	Yes [1]	No
Vulnerability to hot-wallet key exploits	High	High	Moderate	Moderate	High	Immune
Vulnerability to crypto-economic attacks	Moderate	High	Moderate	Moderate	Moderate	Immune
Cryptographic primitives	Standard	Standard	Standard	Standard	New	New
Performance / economics						
Max throughput on ETH 1.0	1..∞ TPS [2]	10k+ TPS	1k..9k TPS [2]	2k TPS [3]	20k+ TPS	2k TPS
Max throughput on ETH 2.0	1..∞ TPS [2]	10k+ TPS	1k..9k TPS [2]	20k+ TPS	20k+ TPS	20k+ TPS
Capital-efficient	No	Yes	Yes	Yes	Yes	Yes
Separate onchain tx to open new account	Yes	No	No	No	No	No [5]
Cost of tx	Very low	Low	Very low	Low	Low	Low
Usability						
Withdrawal time	1 confirm.	1 confirm.	1 week [4] ([7])	1 week [4] ([7])	1..10 min [7]	1..10 min [7]
Time to subjective finality	Instant	N/A (trusted)	1 confirm.	1 confirm.	1..10 min	1..10 min
Client-side verification of subjective finality	Yes	N/A (trusted)	No	No	Yes	Yes
Instant tx confirmations	Full	Bonded	Bonded	Bonded	Bonded	Bonded
Other aspects						
Smart contracts	Limited	Flexible	Limited	Flexible	Flexible	Flexible
EVM-bytecode portable	No	Yes	No	Yes	No	No
Native privacy options	Limited	No	No	No	Full	Full

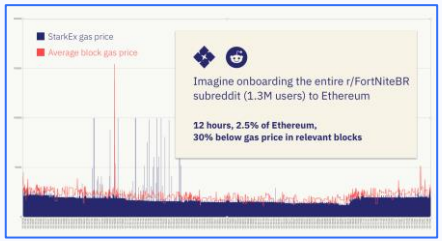
[0] Some researchers do not consider them to be part of L2 space at all, see https://twitter.com/gakonst/status/1146793685545304064
[1] Depends on the implementation of the upgrade mechanism, but usually applies.
[2] Complex limitations apply.
[3] To keep compatibility with EVM throughput must be capped at 300 TPS
[4] This parameter is configurable, but most researchers consider 1 or 2 weeks to be secure.
[5] Depends on the implementation. Not needed in zkSync but required in Loopring.
[7] Can theoretically be accelerated with liquidity providers but will make the solution capital-inefficient.

Matter Labs

Reddit is hosting an Ethereum scaling competition

Reddit recently announced a partnership with the Ethereum Foundation to find a Layer 2 scaling solution that can support it's existing community points users and eventually scale to all of the site's 430 million users. A full-scale Reddit integration has potential to bring Ethereum to the mainstream.. Current Rinkbey testnet experiments in r/cryptocurrencies and r/fortnite have light adoption with 5.1k and 26k users, respectively.

The Starkware team recently used StarkEx in a demo, to show how easily it could onboard the large userbases. Without using StarkEx, this would have consumed the entire network for 4.5 days



How do Layer 2s fit in with ETH 2?

EIP 2537 adds support for the BLS12-381 curve that ETH 2 is using and allows smart contracts to be light clients of ETH 2. The BLS12-381 precompile enables new smart contracts to be written that verify data from ETH 2 shards. So when Phase 1 is launched and introduces shards, this will boost data availability for existing ETH 1 rollups, reducing the data bottleneck for roll-ups and enabling them to become more scalable. Near term, roll-ups can scale ETH 1 data layer ~2-3k TPS and then ~100k TPS in (Phase 1 of ETH 2).

Sources: Matter Labs, Starkware, Vitalik, Etherscan 1, Etherscan 2, Dune Analytics – Dan Yanev

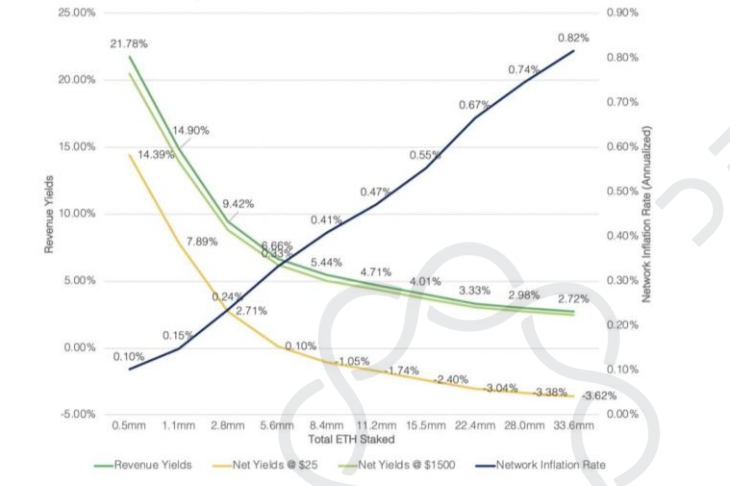
Staking Yields – Incentives

We wanted to touch on whether or not the incentives will be attractive enough to entice enough stakers for long term network security. With a lot of focus on the Bitcoin sustainability, PoS has yet to be tested at such a large scale and it remains to be seen what the right level of issuance is. There is significant time horizon risk given the uncertainty around the length of the ETH lockup period, by the way during which staking rewards are not compounded. **With the continued ascension of DeFi and now yield farming becoming more prominent, careful consideration must go into the opportunity cost of staking ETH**. As the 2nd largest crypto asset with a $36 billion market cap, many underestimate the materiality of the impact of the ETH staking market in comparison to the growing DeFi sector with $3.8 billion of value locked. **PoS could enable funds to deploy more capital at scale.** Rewards are expected to be ~5.72% in the medium term.

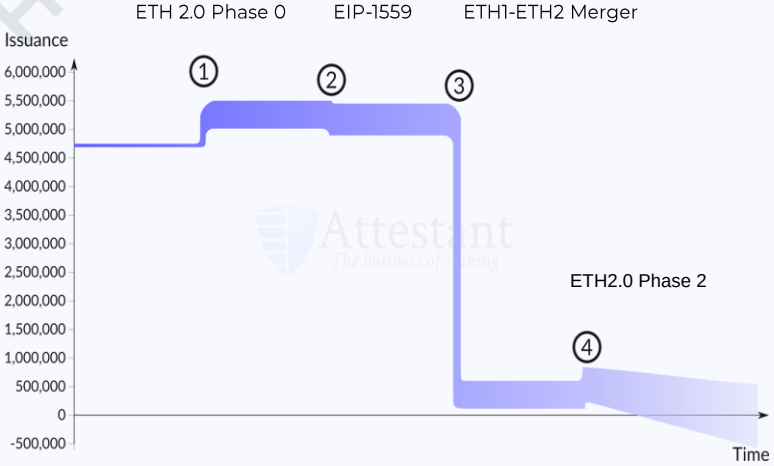
Outstanding Questions:

1. Will ETH need to increase its new supply issuance to produce enough yield? As seen below, rewards for 10m staked are quite low when factoring in the lock-up period. The issuance parameters may need to be raised. 10 million ETH staked is only a little less than 10% of the circulating supply, which is attainable when comparing against other PoS protocols.
2. Given sufficient demand for staking, will it be enough to secure all of the value on top of Ethereum (DeFi & Stablecoins)? Given PoW to PoS switch, attacking ETH 2.0 would require a large % of ETH rather than 51% of hash power. ConsenSys derived min. 13.8% as adequate. We can expect to continue to see a sizeable multiple of value of assets issued to network value going forward.
3. As more ETH 1 gets converted into ETH 2, the scarcity of ETH 1 increases, potentially driving up it's price. **Will the incentives be enough to switch over given the lack of liquidity, inherent risk, and lack of price discovery?**

Network Average Yields and Network Inflation



Potential Issuance Over the Next Few Years



Roughly 0.5% of the ETH supply needs to be staked to activate the Beacon Chain. While the yield early on is attractive, what's more important is the duration over which ETH staked stabilizes. Let's consider a scenario where 7m (6% of supply) is staked over the course of 3 months. The higher net issuance captured by early validators ends up a fleeting number. We can assume there'll be sizeable demand from long term holders. There's been a steady increase in addresses with balance >=32 ETH reaching 123k*, signaling accumulation and potential validators (13% Y/Y Growth).

**Only externally owned addresses are counted*

Note: These are estimates and subject to change. Near term there will be one-off inflation due to parallel chains co-existing. The near term impact of EIP 1559 on net issuance will be small but scales with transactions on the network over time. There's potential to move into the negative inflation territory strengthening ETH's SOV case. In PoS, less issuance is required to secure the network. **The end goal is for the monetary policy to ossify, become sustainable, and become unnecessary to alter**.

Sources: Attestant: Charting Ethereum Issuance ETH 2 Calculator Ethereum 2.0 Economic Review by Tanner Hoban and Thomas Borgers

Staking Alternatives & Competition within DeFi?

Competition with existing DeFi products? – All Ethereum applications effectively compete with staking. One way to gauge if the yield from staking is efficient by examining the opportunity cost of staking. There is significant time horizon risk with Phase 0 staking but the high yields to start are attractive to long term Eth investors and hobbyists. **On the other hand in DeFi, putting unproductive assets to use to generate yield is a major trend that also enables users to easily enter/exit protocols and pick from different options to stack yields.** A lot of it can depend on the market cycle is well. In a bear market, passive yields are viewed as more attractive.

Crypto lending in today's markets is primarily driven by speculation. Brokerage margin lending is a rough comparison, as we see rates of 8-10% on stablecoins. As the market develops and potential lenders become more comfortable with technical risks like smart contract bugs and lending UX improves, the supply of lenders will eventually close the gap in demand from speculative borrowers and margins will eventually compress. In a low interest rate environment in traditional markets, crypto lending has picked up.

Takeaway: If DeFi opportunities such as using Eth as collateral on lending platforms and re-hypothecating collateral like cETH picks up, there will be more ETH 2 staking rewards thanks to less users, perhaps incentivizing stakers. Ultimately, the competition for yield may lead to less network security given the ever increasing number of ways to earn yield in DeFi. However, **the markets may at some point converge to a level of equilibrium as the fluctuation of yields is a balancing act.**

Custodial Lending

celsius

Genesis CAPITAL

BlockFi

Counterparty Risk

Non-Custodial Lending

AAVE

δY/δX

Compound

Technical Risk

Spectrum	Platform	Custody type	Compounding	APY (as of 7/30/20)			
				ETH	DAI	USDC	USDT
DeFi	Compound	Non-Custodial	Daily	0.16%	7.74%	1.55%	1.07%
DeFi	Aave	Non-Custodial	Daily	0.11%	11.32%	0.86%	1.12%
DeFi	dYdX	Non-Custodial	Daily	0.48%	9.94%	1.27%	-
CeFi	BlockFi	Custodial	Monthly	4.50%	-	8.60%	-
CeFi	Celsius	Custodial	Weekly	3.82%	6.11%	8.69%	8.69%

Note: APY numbers are snapshots and do not reflect variance or 30 day averages

Recent Yield frenzy. Is it worth the hype?

Any insanely high API that's marketed as such can be misleading and won't last for long as variable rates can change quite easily with capital quickly flowing in. Many honest farmers have found out the hard way that yield farming is capital intensive and best suited for whales. On top of high gas fees, chasing DeFi yields has it's own risks such as smart contract risk and liquidation risk . At the end of the day it depends on tolerance for leverage, and although the space has plenty of opportunities for advantageous farmers, the addressable market in terms of users today is more niche than that of ETH 2 staking market. Expect to see many similar farming programs to emerge given early success.

Yield Farming / Liquidity Mining

In Yield farming, one deposits assets in a protocol or borrows. Protocol native tokens are then distributed on a pro rata basis based on distribution on both sides. Additionally, providing liquidity to an exchange as an LP entitles one to native tokens. Many of these incentives are subsidized by outside capital and the attractiveness depends on how promising a future share in the protocol is. While APY %s are flashy they are often ephemeral and will be chased down quickly as we've seen happen already.

- The list of programs goes on and on: Compound, YFI, Balancer, mStable, Futureswap , Curve, Ampleforth etc.

While in the below tweet Vitalik points out some fair criticisms, its still early in the game and more robust liquidity incentive programs with better governance will emerge with time.

> "Honestly I think we emphasize flashy defi things that give you fancy high interest rates way too much. Interest rates significantly higher than what you can get in traditional finance are inherently either temporary arbitrage opportunities or come with unstated risks attached."
> – **Vitalik Buterin** via Twitter

Sources: Compound , Aave , dYdX, BlockFi, Celsius

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