

State of Crypto 2024 - a16z crypto

 a16zcrypto.com/posts/article/state-of-crypto-report-2024

October 16, 2024



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When we launched our first annual [State of Crypto report](#) two years ago, the world looked very different. Crypto wasn't high on policymakers' agendas. Bitcoin and Ether exchange-traded products (ETPs) weren't yet SEC approved. Ethereum had not yet [switched](#) to energy-minimizing proof-of-stake. Layer two (L2) networks, designed to increase capacity and lower transaction costs, were largely inactive — and the transactions that did occur on them cost a lot more than they do today.

Times have changed, as our newly released 2024 State of Crypto Report makes clear. Our report covers crypto's rise as a hot policy topic, the many recent tech improvements to blockchain networks, and the latest trends among crypto's builders and users. The report also:

- digs into the emergence of key applications such as stablecoins — one of crypto’s “killer apps”;
- explores the intersection of crypto and other key tech trends like AI, social networks, and games;
- shares new data on swing states’ levels of crypto interest ahead of the U.S. election, and more.

The 2024 State of Crypto report also reveals all-time highs in crypto activity. And it analyzes how blockchain infrastructure has matured — especially after recent scaling upgrades drastically decreased onchain transaction costs alongside the rise of Ethereum L2s and other high-throughput blockchains.

This year, we’re also introducing a new tool: the a16z crypto Builder Energy dashboard. For the first time ever, we’re sharing proprietary data based on our unique view of the crypto landscape, including where the “builder energy” is. The dashboard incorporates thousands of data points — aggregated and anonymized — that are drawn from investment team research, our CSX startup accelerator program, and other industry-wide tracking. Through this tool, anyone can explore what crypto builders are saying about their activity and interests — everything from which blockchains they’re building on, to what types of applications they’re building, as well as which technologies they’re building with, and where they’re based. We plan to update the data every year as part of our annual State of Crypto.

[explore the dashboard](#)

Now for the findings from our 2024 State of Crypto report.

7 key takeaways

- Crypto activity and usage hit all-time highs
- Crypto has become a key political issue ahead of the U.S. election
- Stablecoins have found product-market fit
- Infrastructure improvements have increased capacity and drastically reduced transaction costs
- DeFi remains popular — and it’s growing
- Crypto could solve some of AI’s most pressing challenges
- More scalable infrastructure has unlocked new onchain applications

1. Crypto activity and usage hit all-time highs

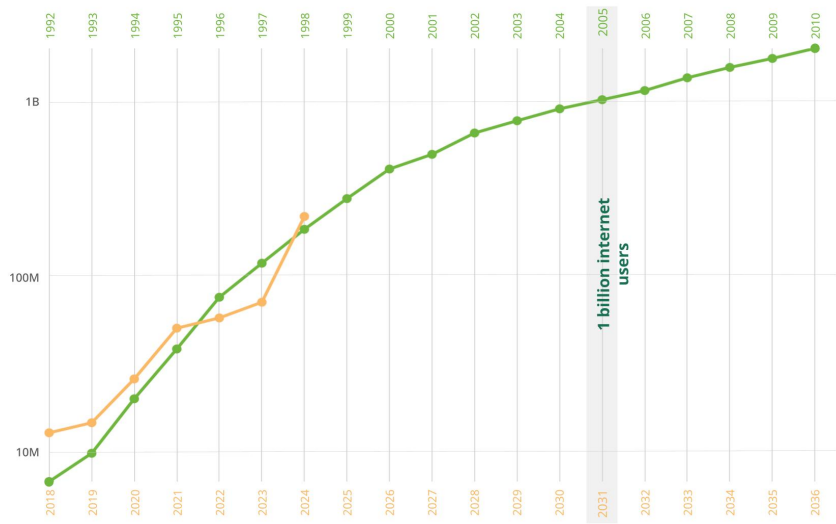
There have never been more monthly active crypto addresses. In September, 220 million addresses interacted with a blockchain at least once, a figure that has more than tripled since the end of 2023. (As a metric, active addresses are easier to game than other measures. See more on that point [here](#).)

Monthly active addresses hit an all-time high of 220 million — with growth reminiscent of early internet adoption

Note: One address does not necessarily correspond to one person. For more on how we think about active addresses and users see [here](#).

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Internet users¹ vs. monthly active crypto addresses² (log scale)



Unique sending addresses as of Dec. of each year; 2024 as of Sept. Blockchains include Aptos, Arbitrum, Avalanche C-Chain, Base, Bitcoin, Blast, BNB Chain, Celo, Ethereum, Fantom, Linea, Near, OP Mainnet, Polygon PoS, Scroll, Solana, Sui, TON, Tron, zkSync, and Zora. EVM addresses active on multiple chains only contribute once to the total.

Sources: 1/ World Bank 2/ Artemis and Dune (@DarenMatsuoka).

The explosion of activity is primarily due to Solana, which accounted for about 100 million active addresses. Following were NEAR (with 31 million active addresses), Coinbase’s popular L2 network Base (22 million), Tron (14 million), and Bitcoin (11 million). Of Ethereum Virtual Machine (EVM) chains, the second-most active after Base was Binance’s BNB Chain (10 million), followed by Ethereum (6 million). (Note: EVM chains were de-duplicated by public key to calculate the 220 million total.)

Addresses are proliferating across many blockchains, with Base and Solana as the most active

Note: One address does not necessarily correspond to one person. For more on how we think about active addresses and users see [here](#).

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Monthly active crypto addresses

Ethereum Virtual Machine (EVM) chains: **52M**

Non-EVM chains: **174M**



220+ million
Monthly active addresses

Some of the above are a16z investments. For a full list see a16z.com/investment-list. This content should not be considered investment advice.

EVM addresses active on multiple chains only contribute once to the total. Sources: Artemis and Dune (@DarenMatsuoka) as of 9/30/2024.

These trends are also reflected in our [Builder Energy dashboard](#). The blockchain that saw the biggest change in total share of builder interest is Solana. Specifically, the total share of founders who told us they either are, or are interested in, building on Solana grew to

11.2% this year from 5.1% last year. Base saw the next biggest jump, its total share growing to 10.7% from 7.8% last year, followed by Bitcoin, which bumped to a total share of 4.2% from 2.6% last year.

A diversity of blockchains are attracting builders, including Ethereum and its adjacent L2 networks, plus Solana, Bitcoin, and others

Builder interest by blockchain

The blockchains that founders say they are — or are interested in — building on

Projects in 2024



Top 5 by change in total share

2023		2024	Change
5.1%	Solana	11.2%	+6.1
7.8%	Base	10.7%	+2.9
2.6%	Bitcoin	4.2%	+1.6
19.7%	Ethereum	20.8%	+1.1
0.4%	Zora	1.3%	+0.9

Layer two (L2) networks are designed to increase capacity and lower onchain transaction costs. This may exclude some onboarding and exit costs. Some of the above are a16z investments. For a full list see a16z.com/investment-list. This content should not be considered investment advice.

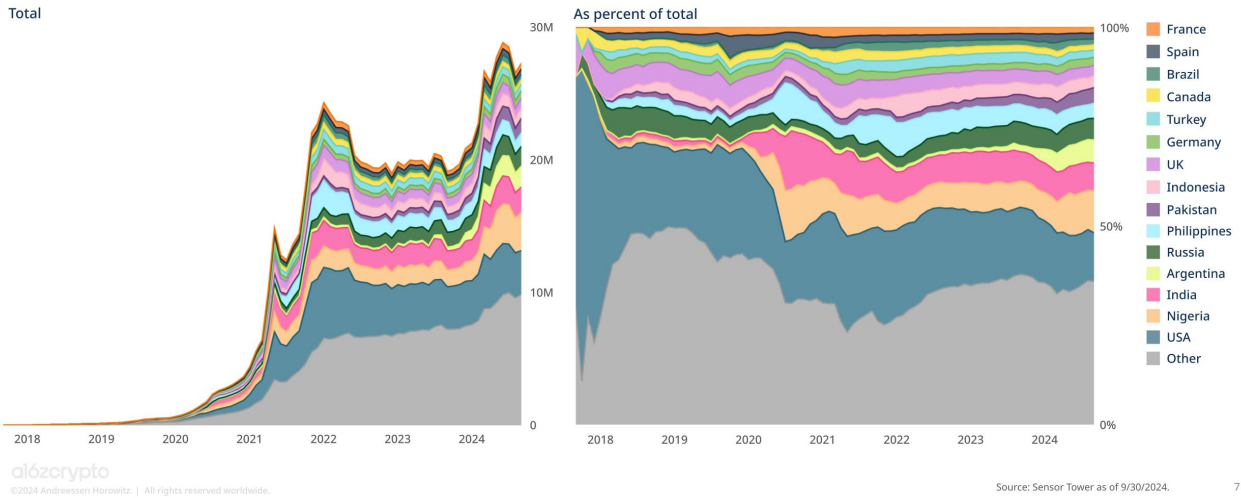
Source: a16z crypto's [Builder Energy Dashboard](#) is based on data from thousands of crypto projects we've tracked over the past two years, including investment team research, our CSX startup accelerator program, and other industry-wide tracking through Sept 2024. Please note this does not include all builders or founders and is meant to be for informational purposes only.

On an absolute basis, Ethereum is still attracting the greatest share of total builder interest at 20.8%, followed by Solana and Base. After that are Polygon (7.9%), Optimism (6.7%), Arbitrum (6.2%), Avalanche (4.2%), Bitcoin (4.2%), and so on.

Meanwhile, the number of monthly mobile crypto wallet users hit an all-time high of 29 million in June 2024. While the U.S. makes up the greatest share of monthly mobile wallet users at 12%, its share of the total mobile wallet user base has declined in recent years as crypto adoption grows globally and as more projects seek regulatory compliance by excluding the U.S. through geofencing.

Mobile wallet use hit record highs, driven by growth in countries such as Nigeria, India, and Argentina

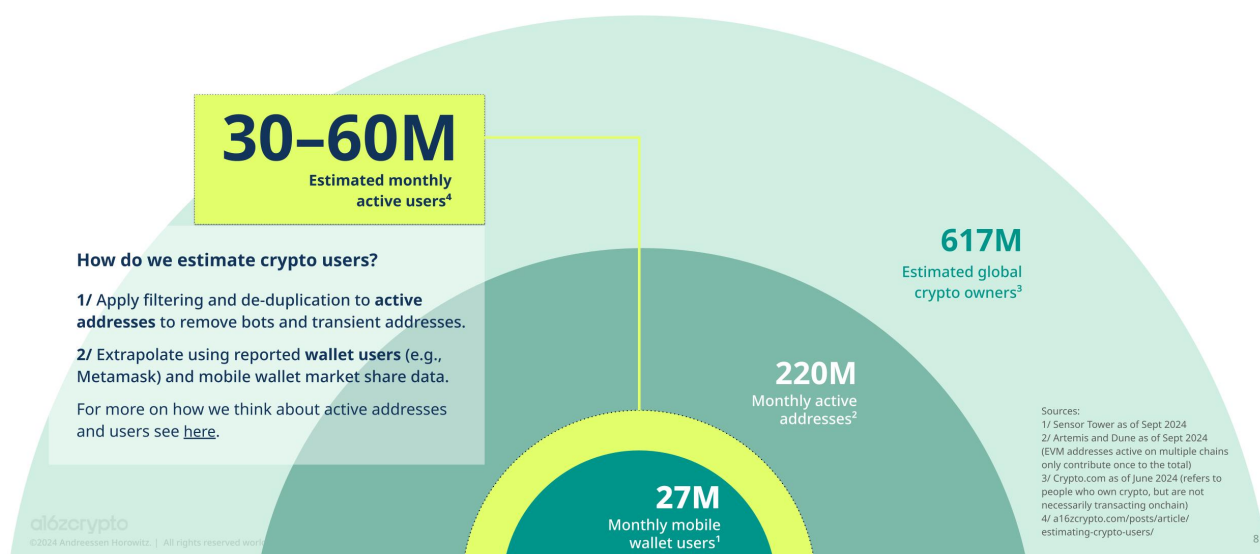
Monthly active mobile crypto wallet users by country



Crypto’s footprint continues to expand abroad. After the U.S., the countries with the greatest share of mobile wallet users include Nigeria (which has sought to provide regulatory clarity including through regulatory incubation programs and has seen significant growth in consumer uses such as bill payments and retail purchases), India (with its booming population and mobile phone adoption), and Argentina (where many residents have flocked to crypto — especially stablecoins — amid currency devaluation).

While it’s easy to measure active addresses and monthly mobile wallet users, it’s much trickier to measure the number of actual active crypto users. However, using a combination of methodological approaches, we’ve estimated that there are 30-to-60 million monthly active crypto users worldwide, a proportion that represents only 5–10% of the total number of the 617 million global crypto owners estimated by Crypto.com in June 2024. (For more on the methodology behind our estimate, see [here](#).)

We estimate that only 5–10% of crypto owners are **active users** — there’s a big opportunity to re-engage passive holders onchain



The disparity underscores the large opportunity to engage — and re-engage — passive crypto holders. As major infrastructure improvements make brand new, compelling apps and consumer experiences possible, more dormant crypto holders could become active onchain users.

2. Crypto has become a key political issue ahead of the U.S. election

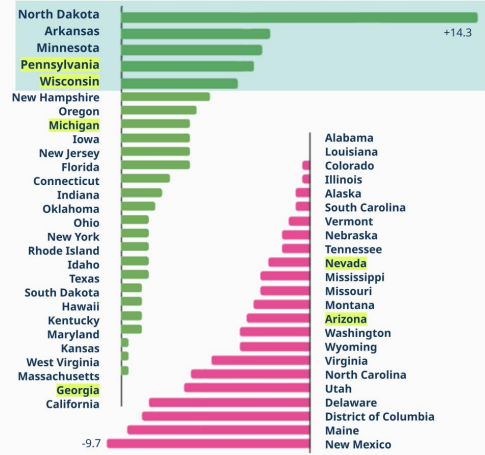
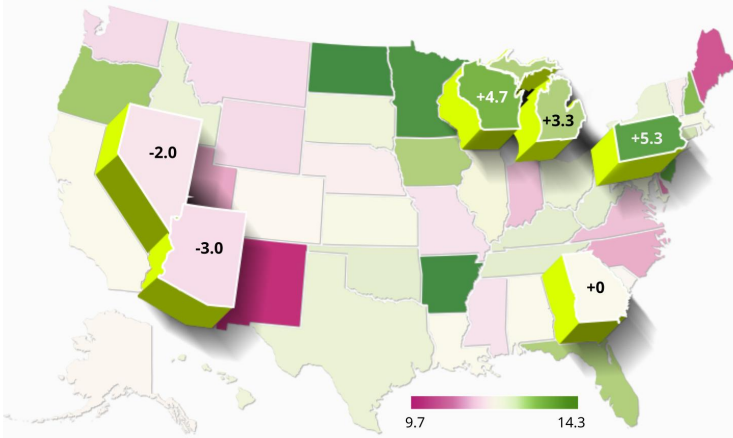
Crypto has broken into the national discourse this election cycle.

So we measured swing states’ relative levels of crypto interest. Two battlegrounds expected to be among the tightest races in November — Pennsylvania and Wisconsin — have seen the fourth- and fifth-biggest jumps in crypto search interest since the last election in 2020, measured as a proportion of total searches using Google Trends. Michigan saw the eighth-biggest jump in crypto search interest, while Georgia stayed put. Meanwhile, Arizona and Nevada experienced moderate drops in interest since 2020.

Crypto interest is rising in several swing states — Pennsylvania and Wisconsin see Top 5 biggest jumps

Crypto search interest (as a proportion of total searches in each state)

Change in rank from 2020–2024¹



^{1/} Ranking based on an average across searches for "bitcoin", "ethereum", "crypto". 2024 includes data through 9/30/2024. Source: Google Trends.

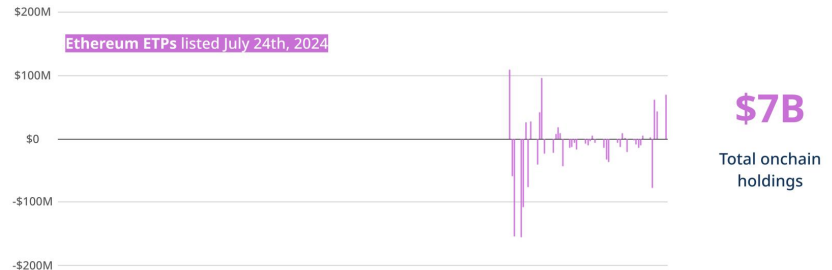
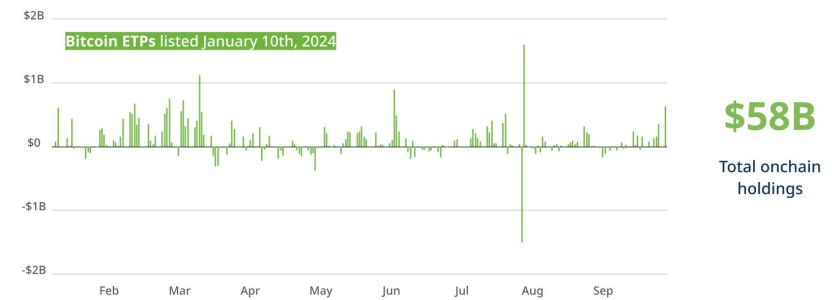
One factor that could have raised people’s crypto interest this year was the listing of Bitcoin and Ethereum exchange-traded products (ETPs). The number of Americans who hold crypto could grow as ETPs such as these broaden investor access. Together, the Bitcoin and Ethereum ETPs already contain \$65 billion in onchain holdings. (Note: Though commonly called ETFs, these products are actually registered as ETPs using SEC Form S-1, indicating the underlying portfolios are not comprised of securities.)

The SEC’s Bitcoin and Ethereum ETP approvals have broadened investor access to crypto

Note: Though commonly called ETFs, these are actually registered as ETPs using SEC Form S-1, indicating the underlying portfolios are not comprised of securities.

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Bitcoin and Ethereum exchange-traded products (ETPs) daily net flows¹



^{1/} Net flows exclude flows into pre-existing products like the Grayscale Bitcoin and Ethereum Trusts which were eventually converted to ETPs.

Source: Dune (@hidobby) as of 9/30/2024. 15

The SEC’s ETP approvals represent major crypto policy milestones. Regardless of which party wins office in November, many politicians expect momentum to build with the passage of bipartisan crypto legislation. An increasing number of policymakers and politicians are speaking positively about crypto on both sides of the aisle.



"We will partner together to invest in America's competitiveness, to invest in America's future. We will encourage innovative technologies like AI and digital assets while protecting consumers and investors."

> Vice President Kamala Harris



"This afternoon I'm laying out my plan to ensure that the United States will be the crypto capital of the planet and the bitcoin superpower of the world and we'll get it done."

> Republican presidential candidate Donald Trump



"We all believe in the future of crypto....I want to bring members on both sides of the aisle here in the Senate together...so we can pass sensible [crypto] legislation that helps the United States maintain its status as the most innovative country in the world."

> Sen. Chuck Schumer (D-NY)



"The U.S. has always been a financial leader, but we're on the brink of being left behind in the digital asset race....now Congress needs to pass essential legislation to secure our financial future."

> Sen. Cynthia Lummis (R-WY)



"We've been working hard to develop a comprehensive cryptocurrency framework that enables entrepreneurs and businesses to innovate responsibly while also protecting consumers and cracking down on bad actors."

> Sen. Kirsten Gillibrand (D-NY)



"Regardless of the outcome, I expect you to see digital asset legislation start to move in both bodies....I think it is 'when,' not 'if,' regardless of who's in charge."

> Majority Whip Tom Emmer (R-MN)



"These [crypto builders] are focused on innovating and creating jobs in the U.S. An already difficult task made tougher without clear guardrails or regulation."

> Rep. Ro Khanna (D-CA)



"We'll continue fighting for rules and regulations for digital assets that promote innovation, protect consumers, and keep opportunity here in America, not overseas."

> Sen. Tim Scott (R-S.C.)

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Sources: [whitehouse.gov](https://www.whitehouse.gov), [CNBC](https://www.cnbc.com), [cryptonews.com](https://www.cryptonews.com), [CNBC](https://www.cnbc.com), [Decrypt](https://decrypt.co), [CNBC](https://www.cnbc.com)

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Democrats and Republicans recognize the opportunity for crypto and are ready to pass bipartisan legislation

The industry has inspired other significant movements on the policy front this year as well. At the federal level, the House of Representatives approved the Financial Innovation and Technology for the 21st Century (FIT21) Act with bipartisan support, including 208 Republicans and 71 Democrats voting in favor. Pending Senate proceedings and approval, the bill could provide much-needed regulatory clarity to crypto entrepreneurs.

No less meaningfully, at the state level, Wyoming passed the Decentralized Unincorporated Nonprofit Association (DUNA) Act, a law that gives decentralized autonomous organizations (DAOs) legal recognition and enables blockchain networks to operate lawfully without compromising on decentralization.

The crypto industry is on a path toward more regulatory clarity after some major policy wins in 2024



Wyoming Decentralized Unincorporated Nonprofit Association Act (DUNA)

March 2024

Signed into law with an effective date of July 1, 2024

Recognizes DAOs as legal entities, enabling blockchain networks to operate lawfully without compromising their decentralization



U.S. Financial Innovation and Technology for the 21st Century Act (FIT21)

May 2024

Passed the House with bipartisan support, including 71 Democrat votes

Provides regulatory clarity for crypto, protects consumers from bad actors, and promotes American innovation — pending Senate approval



EU Markets in Crypto-Assets Regulation (MiCA)

December 2024

Goes fully into effect, after approval by a large majority in 2023

The European Union's first comprehensive regulatory framework involving crypto assets and related service providers

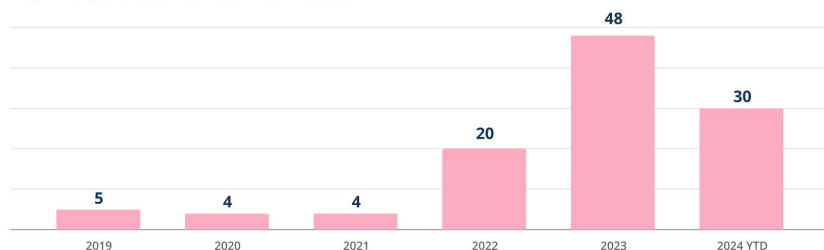
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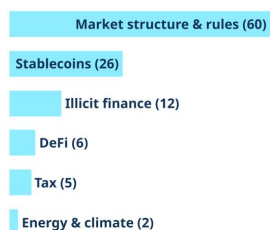
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The EU and the United Kingdom have been the most proactive in engaging the public on questions of crypto policy and regulation. Various European agencies have put out many more calls for input than, for example, the U.S. Securities and Exchange Commission. Meanwhile, the European Union’s Markets in Crypto Act (MiCA) is the first comprehensive crypto-related policy regime to pass into law and it is set to come into full effect by the end of the year.

Major crypto policy calls for input



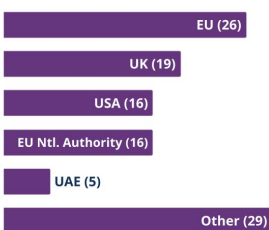
By topic



By authority



By jurisdiction



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Source: a16z crypto analysis as of 9/30/2024.

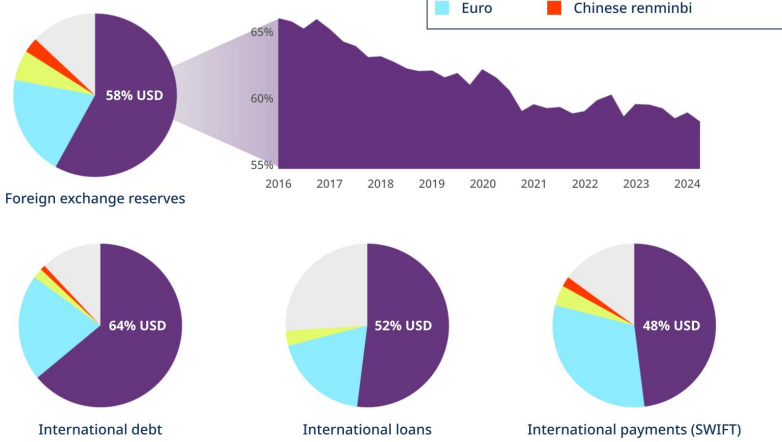
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The **EU** and **UK** lead when it comes to public engagement on crypto policy and regulation

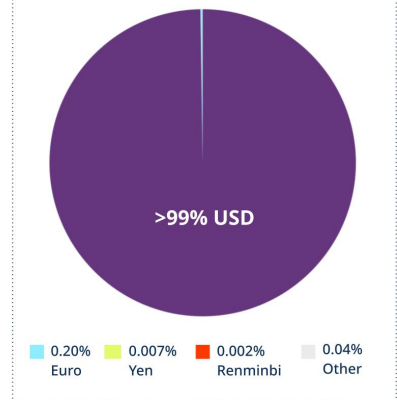
Stablecoins — which have become one of the most popular crypto products — are one of the biggest topics for policy discussion, with several bills already floating around Congress. One of the tailwinds, at least in the U.S., is the realization that stablecoins can fortify the U.S. dollar’s position abroad even as the dollar’s global reserve currency status slips. Today, more than 99% of stablecoins are denominated in USD, which dwarfs the next largest denomination: 0.20% in Euro.

Stablecoins can strengthen the U.S. dollar's position as its global reserve currency status slips

Currency share in the global economy^{1 2}



Currency share of stablecoins³



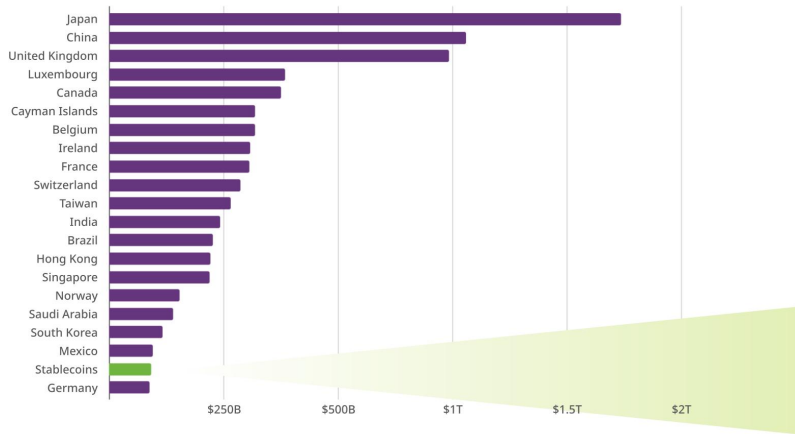
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Sources: 1/ Stablecoin report by Castle Island Ventures, Brevan Howard Digital, and Artemis (Sept 2024) 2/ IMF as of 6/30/2024 3/ CoinGecko as of 9/30/2024. 17

In addition to projecting the power of the American dollar around the world, stablecoins are potentially strengthening the country's financial footing at home. Despite being only a decade old, stablecoins have risen to become a top 20 holder of U.S. debt, putting them ahead of countries like Germany.

Stablecoins are only a decade old — now they're a Top 20 and rising holder of U.S. debt

Stablecoins compared to major foreign holders of U.S. Treasury securities



Tether

\$81 billion held in U.S. Treasuries

Launched in 2014



USDC

\$11 billion held in U.S. Treasuries

Launched in 2018

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Sources: U.S. Department of the Treasury and latest statements from Tether and Circle as of 6/30/2024. 18

While some countries are exploring central bank digital currencies (CBDCs), the stablecoin opportunity sitting right in front of the U.S. is ripe for the taking. Between these discussions and the number of prominent political figures now weighing in about crypto generally, we expect more countries will start to flesh out their crypto policies and strategies in earnest.

3. Stablecoins have found product-market fit

By enabling fast, cheap, global payments, among other uses, stablecoins have become one of crypto's most obvious "killer apps". Indeed, as Rep. Ritchie Torres (D-N.Y.) wrote in September in a *New York Daily News* [op-ed](#), "The proliferation of dollar stablecoins — rendered possible by the ubiquity of smartphones and the cryptography of blockchains — could become the greatest experiment in financial empowerment humanity has ever undertaken."

Major scaling upgrades have drastically reduced the cost to execute crypto transactions, including those involving stablecoins, in some cases by over 99%. On Ethereum, transactions involving USDC, a popular U.S. dollar-pegged stablecoin, cost on average \$1 in gas fees this month, down from \$12 on average in 2021. Sending USDC on Base, Coinbase's popular L2 network, costs less than a cent on average. (Note that these figures may exclude some onboarding and exit costs.)

Compare these fees to the \$44 on average that it costs to send an international wire transfer.

Cost to send USD internationally



Ethereum scaling efforts have slashed onchain transaction costs by over 99%

USDC is a popular stablecoin. Base is a layer two (L2) network. Gas price refers to the cost to perform a transaction. The figures above may exclude some onboarding and exit costs.

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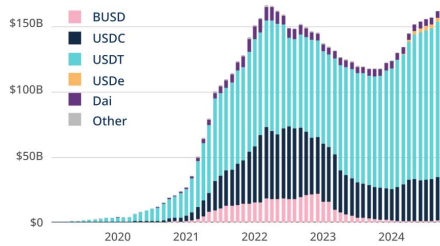
This content should not be considered investment advice.

Sources: Bankrate, Etherscan, Basescan, and CoinGecko as of 9/30/2024.

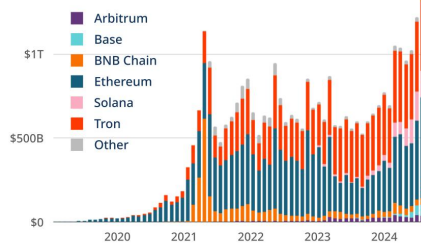
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Stablecoins make it easy to transfer value. They amounted to \$8.5 trillion in transaction volume across 1.1 billion transactions in the second quarter of 2024 ended June 30. Stablecoin transaction volumes *more than doubled* Visa's \$3.9 trillion in transactions over the same period. That stablecoins have entered the same conversation as such well-known and entrenched payment services as Visa, PayPal, ACH, and Fedwire is a remarkable testament to their utility.

Stablecoin supply by issuer¹



Adjusted transfer volume¹ by blockchain



**Stablecoins
have found
product
market fit**

Stablecoins vs. Paypal, Visa, ACH, and Fedwire in Q2 2024²

	Transaction volume (\$)	# of transactions
Stablecoins	\$8.5 tn	1.1 bn
PayPal	\$0.42 tn	6.6 bn
Visa	\$3.96 tn	59.3 bn
ACH	\$21.6 tn	8.3 bn
Fedwire	\$284.2 tn	0.05 bn

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1/ Source: Artemis as of 9/30/2024 | Adjusted transfer volume is designed to strip out MEV activity and intra-centralized exchange transfers, providing a clearer picture of genuine user-driven stablecoin activity.

2/ Sources: Artemis, PayPal, Visa, Nacha, FRB Services as of 6/30/2024.

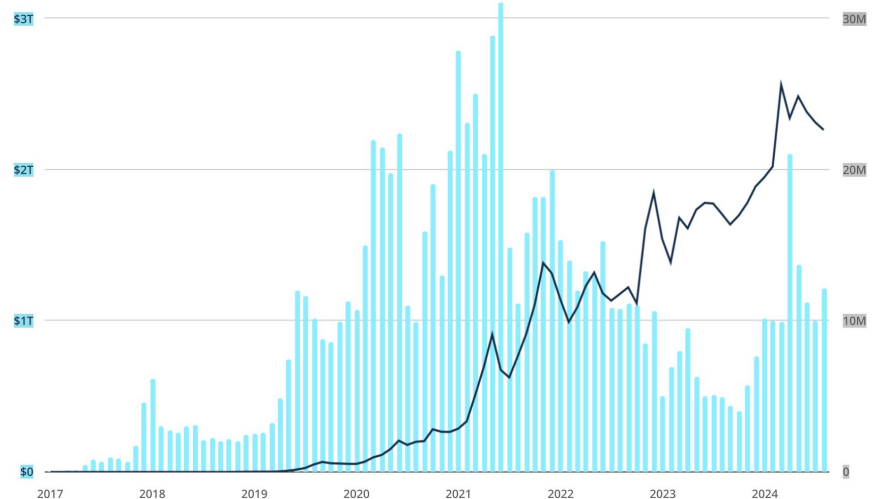
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Stablecoins aren't just a fad either. If you compare stablecoin activity against crypto's volatile market cycles, the two appear to be uncorrelated. Indeed, the number of monthly stablecoin-sending addresses has continued to increase even as spot crypto trading volumes have declined. In other words, people appear to be using stablecoins for more than just trading.

Stablecoin activity has grown despite crypto market cyclicality, highlighting their adoption beyond trading

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Spot crypto trading volume vs. stablecoin monthly sending addresses

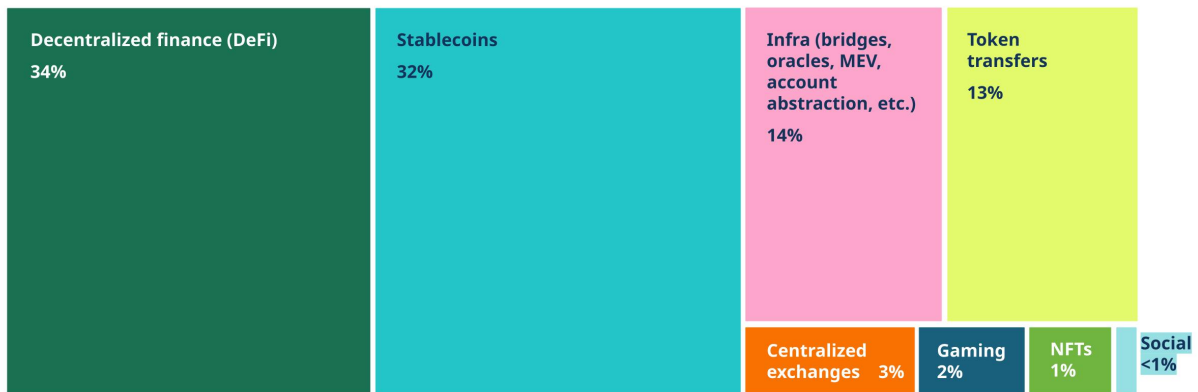


Source: Stablecoin report by Castle Island Ventures, Brevan Howard Digital, and Artemis (Sept 2024). 35

All that activity is reflected in usage stats. Stablecoins represent nearly a third of daily crypto usage at 32%, second only to decentralized finance, or DeFi, at 34%, as measured by share of daily active addresses. The rest of crypto's usage is spread across infrastructure (bridges, oracles, maximum extractable value, account abstraction, etc.), token transfers, and a smattering of other areas, including emerging applications such as gaming, NFTs, and social networking.

DeFi and stablecoins dominate crypto usage today — emerging categories include gaming and social

Category breakdown by daily active addresses (all blockchains)



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Active addresses can be associated with more than one category.
Source: Artemis as of 9/30/2024, excludes wallet-to-wallet transfers.

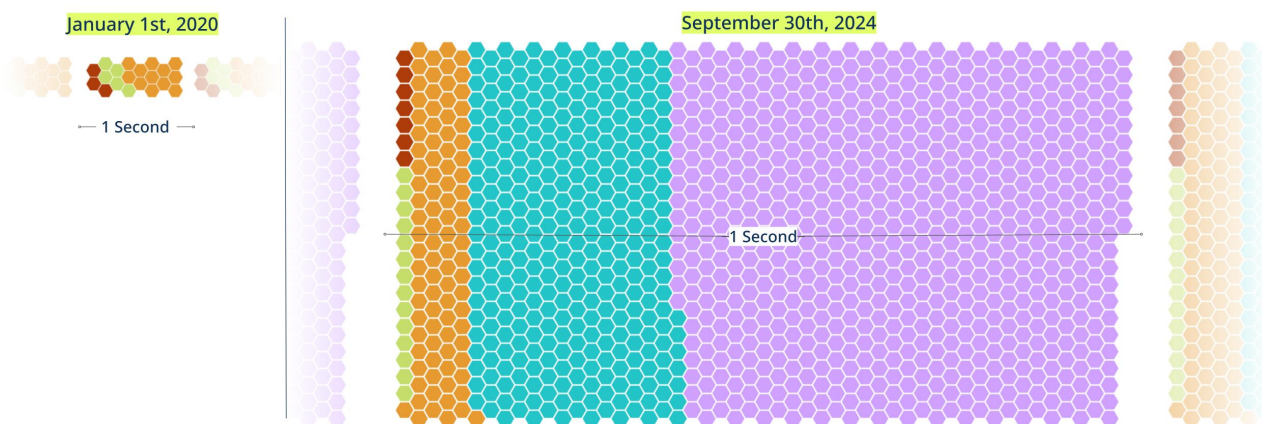
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4. Infrastructure improvements have increased capacity and drastically reduced transactions costs

One reason why stablecoins have gotten so popular and easy to use is due to underlying infrastructure advances. For one thing, blockchain capacity is growing. Blockchains are processing more than 50 times as many transactions per second as they were just four years ago thanks to the rise of Ethereum L2 networks and other high-throughput blockchains.

Blockchains now process 50x as many transactions per second as they did just four years ago

Number of blockchain transactions processed per second



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One dot represents one transaction.
Sources: L2Beat and Chainspect as of 9/30/2024.

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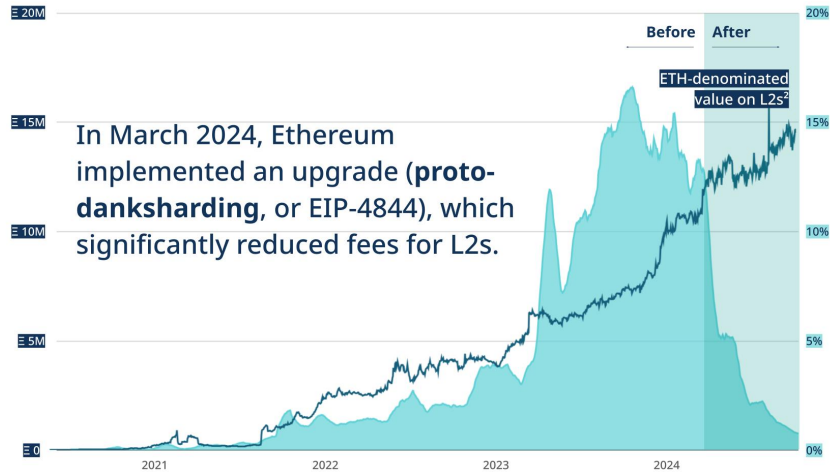
More staggeringly, Ethereum’s biggest upgrade of the year — “Dencun,” also called “protodanksharding” or EIP-4844 — significantly reduced fees for L2 networks after its implementation in March 2024. Since then, the fees paid by L2s on Ethereum have plummeted even as ETH-denominated value on L2s has continued to rise. In other words, blockchain networks are getting more popular — and more efficient — all at once.

A significant portion of Ethereum activity is moving to L2s, drastically reducing costs for users

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Fees paid by L2s on Ethereum (% of all L1 fees, rolling 30d avg)¹ before and after EIP-4844



In March 2024, Ethereum implemented an upgrade (**protodanksharding**, or EIP-4844), which significantly reduced fees for L2s.

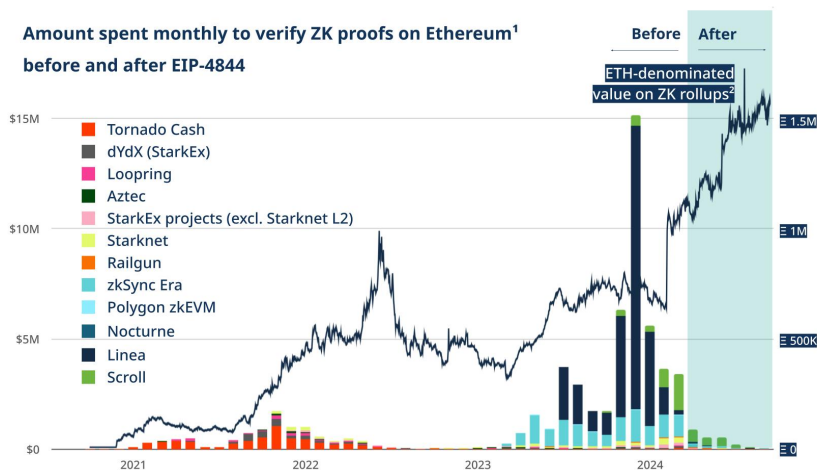
EIP-4844 is an Ethereum upgrade designed to reduce fees for layer twos (L2s), networks designed to increase capacity and lower onchain transaction costs. This may exclude some onboarding and exit costs.

Sources: 1/ Dune (@funnyking) as of 9/30/2024 2/ L2Beat as of 9/30/2024. 23

It’s a similar story for zero knowledge (ZK) proofs, another technology that has important implications for blockchain scaling, privacy, and interoperability. Even as the amount spent monthly to verify ZK proofs on Ethereum has declined, ETH-denominated value on ZK rollups has increased. In other words, ZK proofs are getting cheaper, too, even as they’re getting more popular. (We use zero knowledge here as a catchall for cryptography that can succinctly prove that computations offloaded to rollup networks were performed correctly.)

Zero knowledge proofs may be the endgame for blockchain privacy, scaling, and interoperability

Amount spent monthly to verify ZK proofs on Ethereum¹ before and after EIP-4844



Today, there are more than **250** crypto projects actively working to advance ZK technology³

Zero knowledge is used as a catch-all for cryptography that can succinctly prove that offloaded computations were performed correctly.

Sources: 1/ Dune (@nebra) 2/ L2Beat 3/ Electric Capital ZK Market Map, all as of 9/30/2024.

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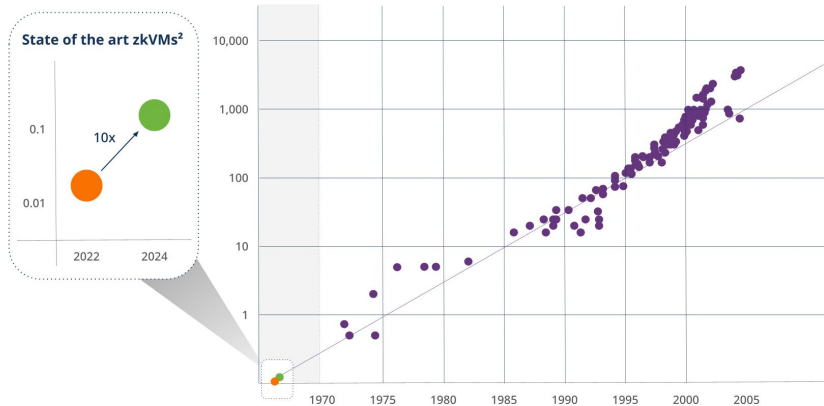
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ZK technology is extremely promising as it opens new pathways to cheap, verifiable blockchain compute for developers. Still, ZK-based virtual machines (zkVMs) have a long way to go before they can catch up to the performance of traditional computers — a humbling observation to note.

Zero knowledge virtual machines (zkVMs) are improving, but there is still a long way to go

Intel CPU clock speed in MHz (log scale)¹



zkVMs allow developers to write programs in high-level, programmer-friendly languages like Rust or Go without requiring any knowledge of the underlying math that proves their execution. But the improved usability typically adds significant performance overhead.

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Sources: 1/ Intel, Wikipedia, K. Olukoton (published by Bruno Carpentieri in 2015) 2/ a16z crypto analysis as of 9/30/2024. 30

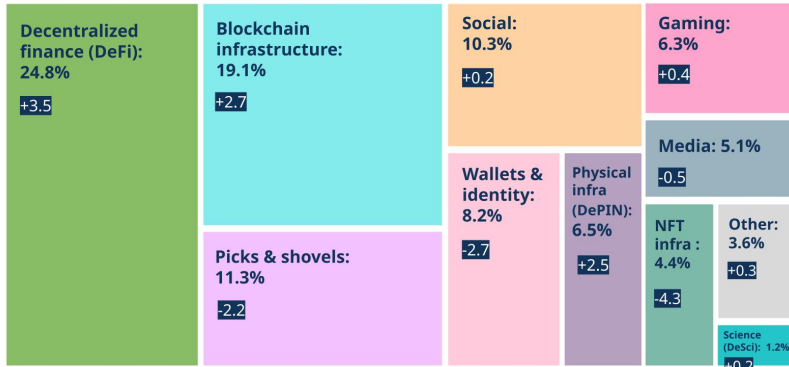
With all of these infrastructure improvements, it's easy to see why blockchain infrastructure remains one of the most popular categories for builders and why L2s have become one of the top 5 hottest builder subcategories that we're tracking.

DeFi, blockchain infrastructure, and DePIN are some of the hottest categories in 2024 for builder activity

Builder activity by category

Our breakdown of the areas in which projects are building

Projects in 2024 vs 2023



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Top subcategories in 2024

DeFi	Real world assets
DeFi	Payments
Blockchain infrastructure	L2 blockchains
DeFi	Exchange
Social	Social networks

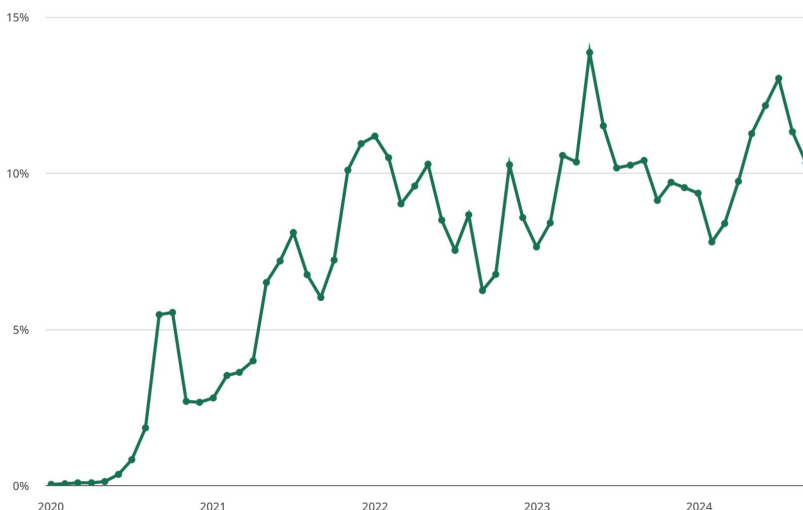
Source: a16z crypto's [Builder Energy Dashboard](#) is based on data from thousands of crypto projects we've tracked over the past two years, including investment team research, our CSX startup accelerator program, and other industry-wide tracking through Sept 2024. Please note this does not include all builders or founders and is meant to be for informational purposes only.

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5. DeFi remains popular — and it's growing

The only category attracting builders more than blockchain infrastructure is decentralized finance, or DeFi (which also accounts for the most crypto usage at 34% of daily active addresses). Since DeFi's arrival in the summer of 2020, decentralized exchanges, or DEXs, have grown to account for 10% of spot crypto trading activity — all of which occurred on centralized exchanges just four years ago.

Share of decentralized exchange spot trading volume (%)



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Sources: The Block and DeFiLlama as of 9/30/2024.

Crypto trading is increasingly happening on decentralized exchanges since DeFi summer 2020

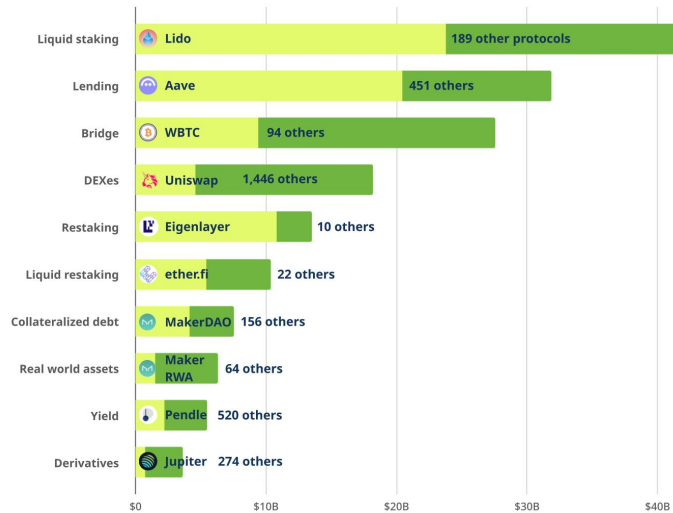
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More than \$169 billion is now locked inside thousands of DeFi protocols. Some of the top DeFi subcategories involve staking and lending.

Thousands of **DeFi** protocols now control billions of dollars — and leaders are emerging

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Top DeFi categories by total value locked

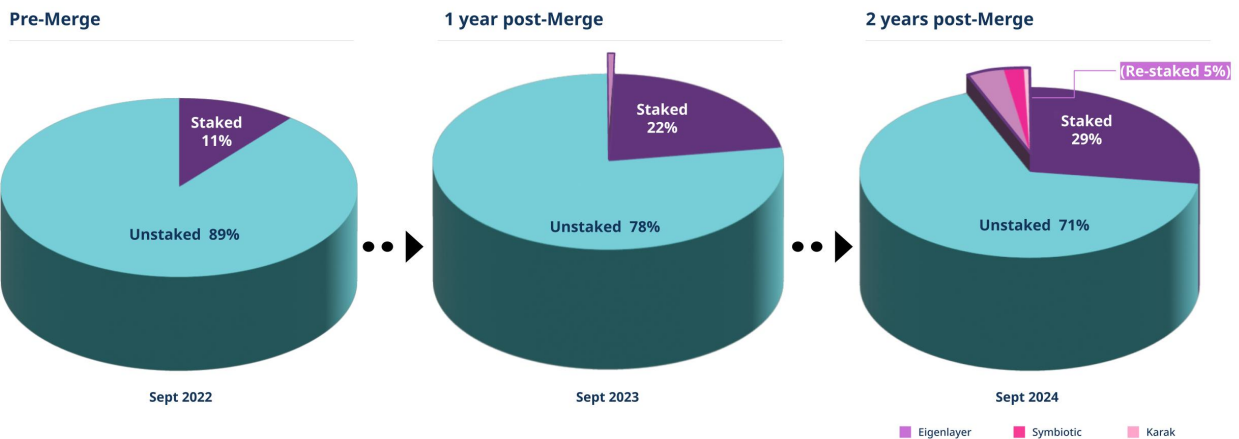


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Source: DefiLlama as of 9/30/2024. 41

It's been just over two years since Ethereum completed its transition to proof-of-stake, drastically reducing the network's energy consumption and environmental footprint. Since then, the share of Ether being staked has risen to 29%, up from 11% two years prior, greatly enhancing the security of the network.

The share of ETH being staked — and sometimes re-staked — is up and it's increasing the security of the network



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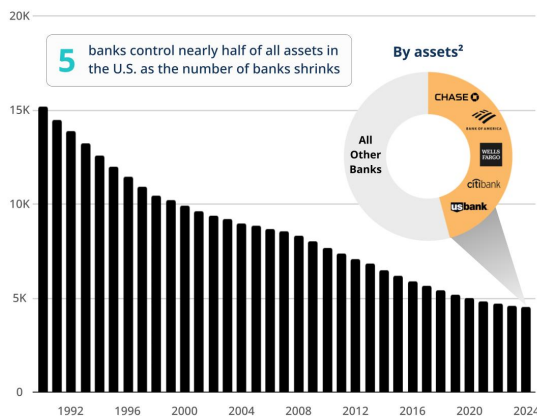
Some of the above are a16z investments. For a full list see a16z.com/investment-list. This content should not be considered investment advice.

Sources: Etherscan, beaconcha.in, and Dune (@blocklytics) as of 9/30/2024. 31

While still in its early stages, DeFi presents a hopeful alternative to the trend of centralization and power consolidation afflicting the U.S. financial system, where the number of banks has dropped by two-thirds since 1990 and where an increasingly small share of big banks dominate assets.

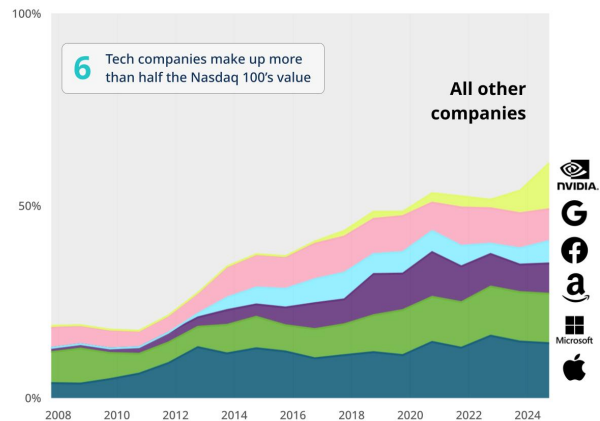
As finance and tech consolidate power in Big Banks and Big Tech, there's a growing need for decentralization

Number of FDIC-insured banks¹



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Market cap of the Nasdaq 100³



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Sources: 1/ FDIC as of 6/30/2024 2/ Federal Reserve as of 6/30/2024 3/ CapIQ and YCharts as of 9/30/2024.

20

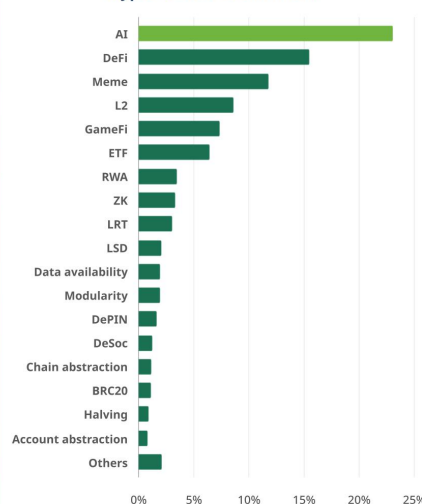
6. Crypto could solve some of AI's most pressing challenges

AI is one of the hottest trends this year, not only in tech broadly, but also in crypto specifically.

AI is one of the most talked about trends among crypto influencers on social media. Perhaps more surprisingly, there's major overlap between visitors to chatgpt.com and visitors to top crypto websites, indicating strong ties between crypto and AI users.

There is heavy overlap between crypto and AI users

Narrative mindshare¹ from crypto-related social media



1/ Narrative mindshare measures dominance relative to the overall market by dividing social mentions of each narrative by the number of mentions from people who are considered part of Crypto Twitter (based on Kaito's proprietary search engine and social graph data). RWA is real world assets. LRT is liquid restaking tokens. LSD is liquid staking derivatives. BRC-20 is a Bitcoin token standard | Source: Kaito (via @sandraaleow)

% of website's audience also visiting chatgpt.com²



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2/ Source: SimilarWeb as of Aug 2024.

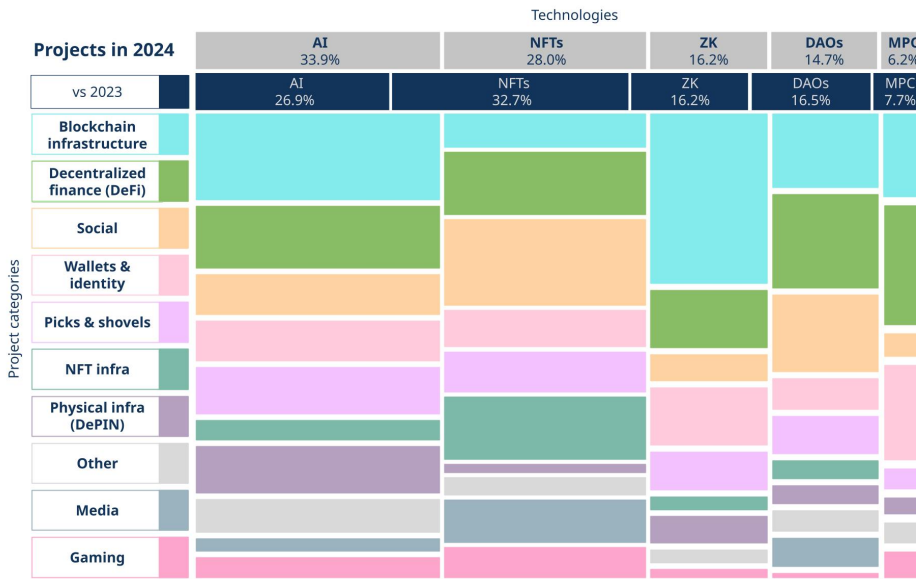
38

Crypto builders also have strong ties to AI. About a third of crypto projects — 34% — say they're using AI, regardless of the category in which they're building, up from 27% a year ago, per our [Builder Energy dashboard](#). The most popular category for applied AI tech is

blockchain infrastructure projects.

Builder activity by applied technology

The technologies that builders are using across categories (boxes show % breakdown by intersection of project category and technology)



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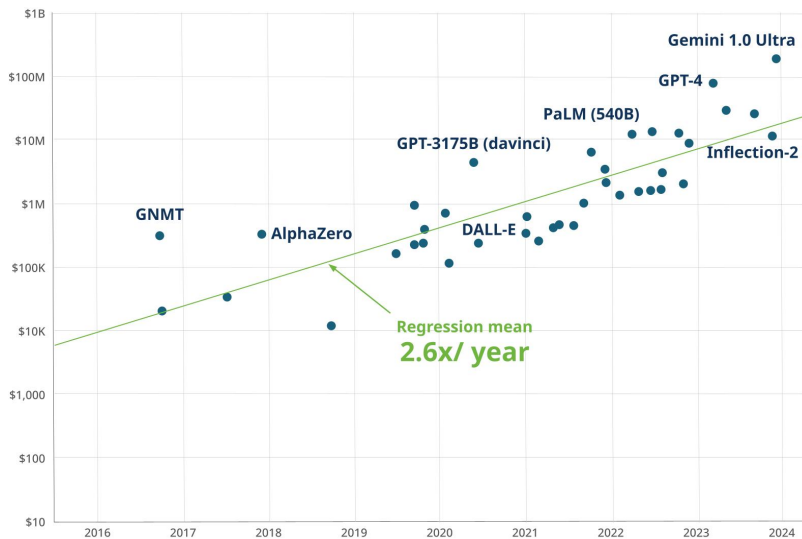
Source: a16z crypto's [Builder Energy Dashboard](#) is based on data from thousands of crypto projects we've tracked over the past two years, including investment team research, our CSX startup accelerator program, and other industry-wide tracking through Sept 2024. Please note this does not include all builders or founders and is meant to be for informational purposes only.

Builders show increasing interest in AI in 2024, commonly used by infra, DeFi, DePIN, and picks & shovels projects

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Given that the cost of training frontier AI models has increased at four-times per year over the past 10 years, we believe AI could trend toward increasing centralization of power on the internet. Left unchecked, only the biggest tech companies may have the resources to train the latest AI models.

Cloud compute cost, in 2023 USD, to train frontier AI models over time (log scale)



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Source: Epoch AI (Report from June 2024).

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AI training costs are growing exponentially, a trend that we believe favors power centralization in the biggest tech companies

AI's centralization-related challenges are almost exactly the inverse of the opportunities for decentralization presented by blockchain networks. Crypto projects are already attempting to tackle some of these challenges today, including Gensyn (by democratizing

access to AI compute), Story (by tracking IP to help compensate creators), Near (by running AI on open source, user-owned protocols), and Starling Labs (by helping to verify the authenticity and provenance of digital media), to name a few.

Blockchains can address some of the most pressing challenges facing the AI industry

15+ billion images were created by AI in a year — more than 150 years of photography

Authenticity
blockchains can help verify the authenticity of content

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Training compute for frontier AI models has increased **~4x** per year over the last 10 years

Democratization
blockchains can help broaden access to compute

Trust in AI companies fell from **50% to 35%** in the U.S. between 2019 and today

Transparency
blockchains can help create open, user-owned services

Frontier models are trained on **trillions** of tokens (data units) from mostly unpaid contributors

Ownership
blockchains can help compensate IP and data contributors

Sources (left to right): EveryPixel (Aug 2023), Epoch AI (Jun 2024), Edelman Trust Survey (Mar 2024), Meta AI Blog (Apr 2024). 37

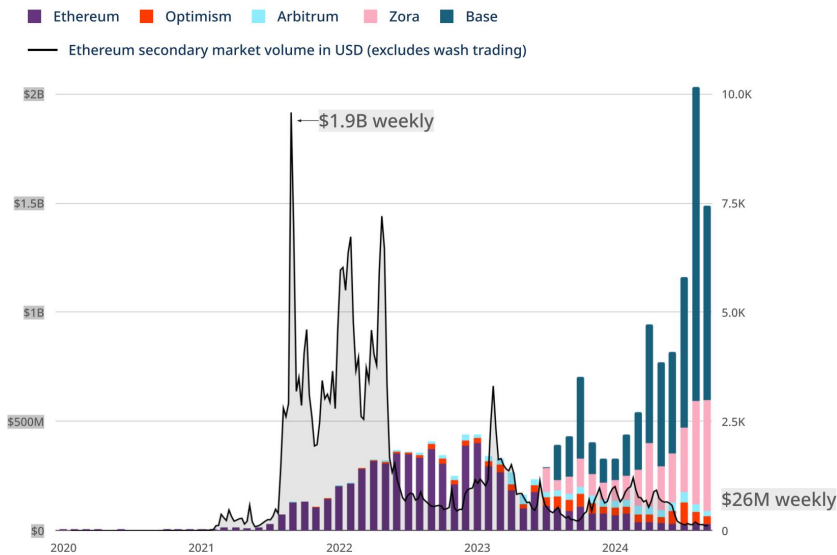
The crossovers between crypto x AI may strengthen in the years ahead.

7. More scalable infrastructure has unlocked new onchain applications

As transaction costs come down and blockchain capacity goes up, many other potential crypto consumer apps become possible.

Take NFTs, for instance. When crypto transactions were much more expensive a few years ago, people were trading NFTs on secondary markets for large sums totaling billions of dollars. That activity has since subsided, and in its place has risen a new consumer behavior: minting low-cost NFT collections on social apps like Zora and Rodeo. This represents a significant shift for the NFT market, one that was largely inconceivable before a drastic reduction in transaction fees.

Number of NFT collections with 50+ unique minters, by blockchain and month



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Sources: Dune (@DarenMatsuoka and @hildobby) as of 9/30/2024.

NFT activity appears to have shifted from high-volume secondary markets to low-cost social collecting experiences

Social networks are another example. Even though they account for only a small portion of daily onchain activity today, they're attracting strong builder activity: 10.3% of crypto projects are social-related in 2024, per our [Builder Energy dashboard](#). In fact, social network-related projects, such as those related to Farcaster, are one of the top 5 hottest builder subcategories this year.

It's early days for decentralized social networks, but vibrant developer ecosystems are emerging around protocols like Farcaster

Farcaster daily active users (7d trailing avg) in 2024

Farcaster ecosystem projects

Clients - general

- Warpcast
- Supercast
- Fids
- nounspace
- Yup
- farquest
- Litecast
- U3
- herocast

Clients - specialized

- Ketchup
- Blivy
- Searchcaster
- Crew
- Alertcaster
- Launchcaster
- Pincaster
- Sealcaster
- Alphacaster
- Sonata
- Eventcaster
- SayMore
- Absorb
- Kiwi News
- Findcaster
- Web3.bio
- Casterscan
- Opencast
- tofui
- Ponder
- Bountycaster
- 33bits
- Magi
- CasterBites
- Terminal

Tools

- CastStorage
- fcstr
- Sharecaster
- Searchcaster
- Fardrop
- Hatecast
- Farcastervote
- Composecast.xyz

Bots

- @remindme
- @launch
- @perl
- @mintit
- @alert
- @survey
- @paragraph
- @bountybot
- @translate
- @ballot
- @events
- @indexer

Services

- Neynar
- Airstack API Studio
- Airstack Explorer
- rTech

Analytics & data

- Intelligent
- Farcaster User Stats
- CastSense
- Tremicaster
- Farcaster Network
- Casterscan
- Goerli Subgraph
- SQLCaster
- Farcaster Insights
- Farcaster Hot 100
- Neynar Frame analytics

Repos

- standard-crypto/farcaster-js
- a16z/farcaster-py
- TheIDB/farcaster-rs
- ertan/go-farcaster
- wewm/frog
- framesjs/frames.js
- gskril/farcaster-indexer
- RigWhitelabs/botcaster
- zachterrell57/farcaster-auth
- gskril/farcaster-search
- YashKarthik/frencaster-2
- whatrocks/farcaster-feed
- noctisatrae/farsign
- davidfurlong/farcaster-auth-tokens
- neynarxyz/farcaster-channels
- Karma3Labs/ts-eigencaster
- fmhall/fc-bot-template
- ponder-surveys/farcaster-survey-bot
- mod-protocol/mod
- pugson/react-farcaster-embed
- Farcaster Solidity
- leosimon/farcaster-scraper

Frames

- Frames Intro and Resources
- Farcaster Frame Tech Spec
- Farcaster Frame TextInput
- Farcaster Frame Resources
- Airstack Onchain Kit For Farcaster Frames
- horsefacts.eth's Base mint with Warps
- ncitron.eth's oframl
- topframes.xyz
- Neynar hosted frames

Community

- Citycaster
- Yash's Directory
- Purple
- FarCon

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Sources: Dune (@pixelhack) and <https://github.com/a16z/awesome-farcaster> as of 9/30/2024.

While builders and consumers explore more social experiences, onchain games are pushing blockchain scaling to its limits. Rollups such as those used by Proof Of Play's high-seas adventure role playing game Pirate Nation are consistently using the most gas per second of any Ethereum rollups.

21/24

Games — long a source of innovation in software — are pushing blockchain scaling to its limits

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Ethereum and its rollups sorted by mega gas used per second (Sept 30, 2024)

Gaming blockchain

		TOTALS					
		TPS	Mgas/s	KB/s			
		348.70 (19.81x)	62.80 (51.48x)	172.93 (30.23x)			
Network	Block	TPS	Mgas/s	KB/s	Stack	DA	Settlement
ProofOfPlay - Apex	50697139	16.5	16.45	10.96	arbitrum-nitro	anytrust	arbitrum
Base	20464204	61.0	9.89	39.32	op-stack	blobs	ethereum
ProofOfPlay - Boss	9803692	9.7	7.04	6.41	arbitrum-nitro	anytrust	arbitrum
Xai	43321074	138.3	6.78	27.82	arbitrum-nitro	anytrust	arbitrum
WINR Chain	11813418	8.4	3.54	6.99	arbitrum-nitro	anytrust	arbitrum
Gravity	8325837	44.5	3.29	18.65	arbitrum-nitro	anytrust	ethereum
ArbitrumOne	258987100	15.3	3.04	11.67	arbitrum-nitro	blobs	ethereum
OP Mainnet	126059489	9.5	2.78	8.96	op-stack	blobs	ethereum
Blast	9453969	6.2	2.72	7.73	op-stack	blobs	ethereum
Mode	13775085	1.0	1.30	0.80	op-stack	blobs	ethereum
Ethereum	20865003	17.6	1.22	5.72	ethereum	ethereum	ethereum
Ham	11127023	0.8	1.04	7.33	op-stack	celestia	base
Scroll	9751915	4.3	0.97	2.44	scroll	blobs	ethereum
Linea	10146944	12.7	0.95	4.96	linea	blobs	ethereum
Mantle	69793722	4.9	0.91	2.39	op-stack	mantle	ethereum
Zora	20511958	0.7	0.60	0.86	op-stack	blobs	ethereum

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These rollups are networks built on Ethereum designed to increase capacity and lower transaction costs. Source: rollup.wtf (built by Conduit.xyz). Snapshot taken on 9/30/2024.

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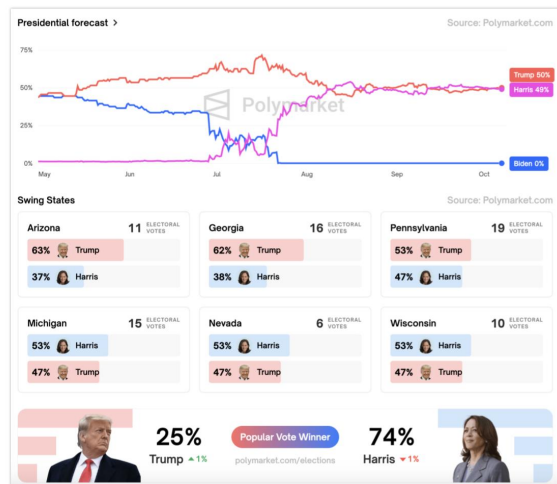
As the November election approaches, crypto-based prediction markets are having a moment — despite their illegality in the U.S. — and momentum is building for prediction markets in general. So much so that Kalshi, a non-crypto-based prediction market that’s registered with the U.S. Commodity Futures Trading Commission, gained a win in a lower court last month as it pursues a federal lawsuit around listing elections contracts. (As of now, registered exchanges are allowed to offer elections-based traditional futures contracts.)

Interest in crypto-based prediction markets is skyrocketing, especially around elections

Monthly prediction market volume on Polymarket



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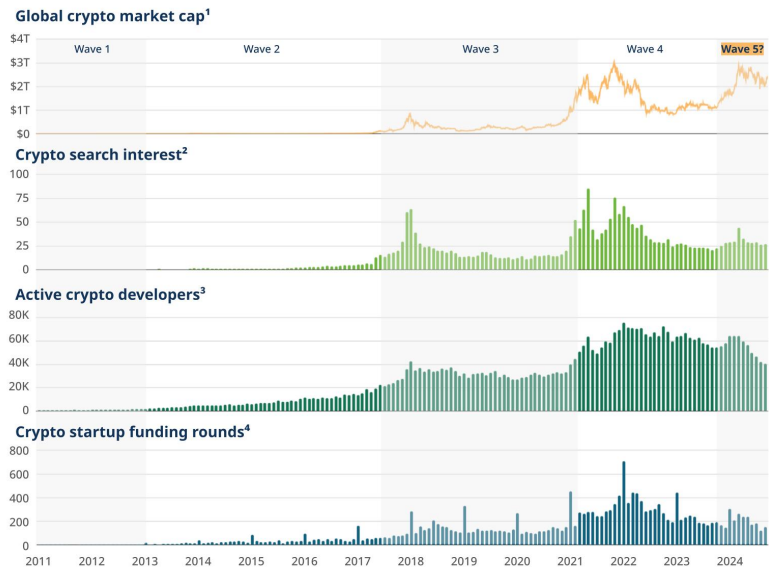
Source: Dune (@brchen8) as of 9/30/2024. 44

Glimmers of novel consumer behaviors are beginning to be discernible. All these new and emerging experiences were intractable when blockchain infrastructure was clunkier and transaction costs were higher. As the blockchains improve along classic tech price-performance curves, expect more of these applications to thrive.

Are we entering a new wave of the crypto price-innovation cycle — or a false start?

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1/ Source: CoinGecko as of 9/30/2024.

2/ Search interest across crypto terms (cryptocurrency, crypto, bitcoin, ethereum, blockchain, web3) | Source: Google Trends + GTAB as of 9/30/2024.

3/ Number of unique GitHub accounts that committed to, forked, or starred a public crypto repository | Source: GitHub + Electric Capital Ecosystems as of 9/30/2024.

4/ Source: PitchBook as of 9/30/2024.

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Where does that leave us? The state of crypto has made significant strides across policy, technology, consumer adoption, and more over the past year. There were policy milestones, including the sudden approval and listing of Bitcoin and Ethereum ETPs, as well as the passage of significant bipartisan crypto legislation. There were major infrastructure improvements, from scaling upgrades to the rise of Ethereum L2s and other high-throughput blockchains. And there were new apps being built and used, from the growth of mainstays like stablecoins to explorations of more nascent categories like AI, social networking, and games.

Whether we have entered the fifth wave of the price-innovation cycle, our framework for understanding the ups and downs of crypto's many market cycles, remains to be seen. Either way, crypto, as an industry, has made inarguable progress over the past year. And as ChatGPT has proven, it can take just one breakout product to shift an entire industry.

Sign up for a16z crypto's biweekly newsletter [here](#). And for more regular data updates, keep an eye on our [State of Crypto Index](#), an interactive tool, updated monthly, that tracks the health of the crypto industry from a technological, rather than financial, perspective through measures of industry rates of innovation and adoption. Also be sure to explore our new [Builder Energy dashboard](#), which tracks where we're seeing the most "builder energy" across crypto.

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