

A large flock of birds flying in a V-formation against a sunset sky. The birds are silhouetted against the bright orange and yellow light of the setting sun. The sky transitions from a deep orange at the horizon to a pale blue at the top. The birds are densely packed in the center of the V and become more sparse towards the edges. The overall scene is dynamic and evocative of a journey or a path forward.

2022 is the end of the beginning

By Paul Brody

The EY logo consists of the letters 'EY' in a bold, white, sans-serif font. The 'E' and 'Y' are connected at the top. A yellow triangle is positioned above the 'Y', pointing downwards towards the top of the letter.

EY

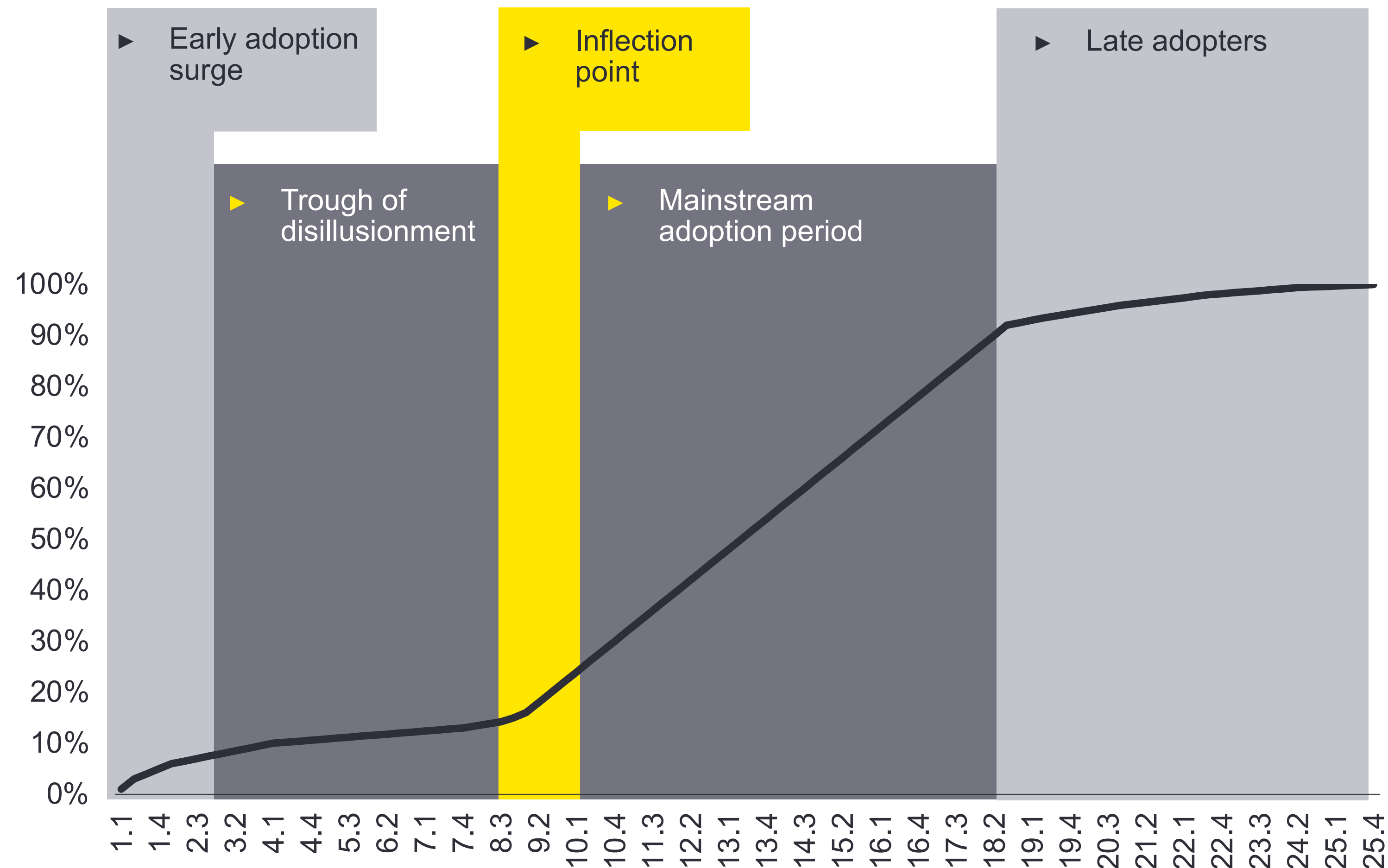
Building a better
working world

Agenda

- 01 **The market has changed**
- 02 New market, new rules
- 03 How to play
- 04 Thinking ahead

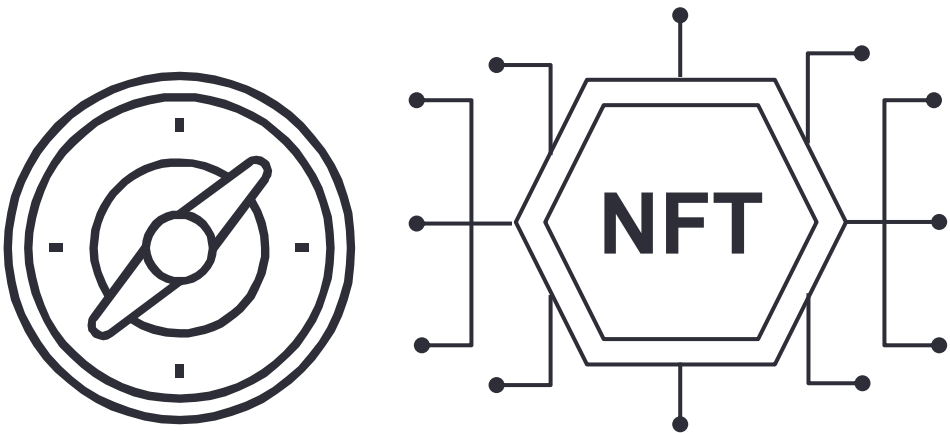


Technology markets go through five phases in their life cycle. In blockchain, we've reached the end of the beginning



- ▶ We've reached the inflection point where we shift from "neat technology" to scaling up usage and adoption to solve specific use cases.
- ▶ The early phases are characterized by high uncertainty and lots of churn as solutions come and go.
- ▶ Once we enter the mainstream adoption period, however, platforms stabilize and usage scales up.

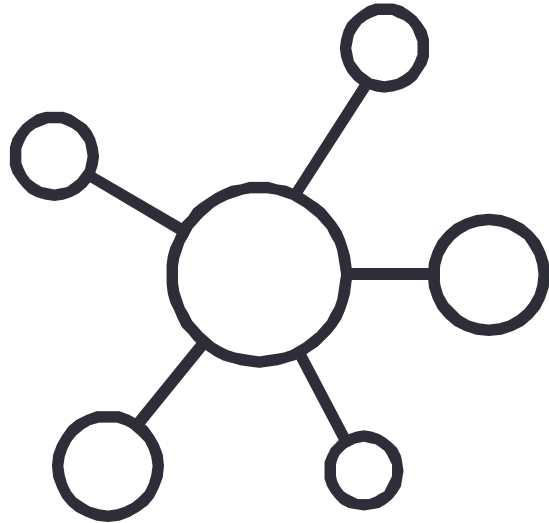
Three killer applications are driving growth in the market and the focus is on adoption, not perfection



**Cryptocurrencies
and non-fungible tokens
(NFTs)**



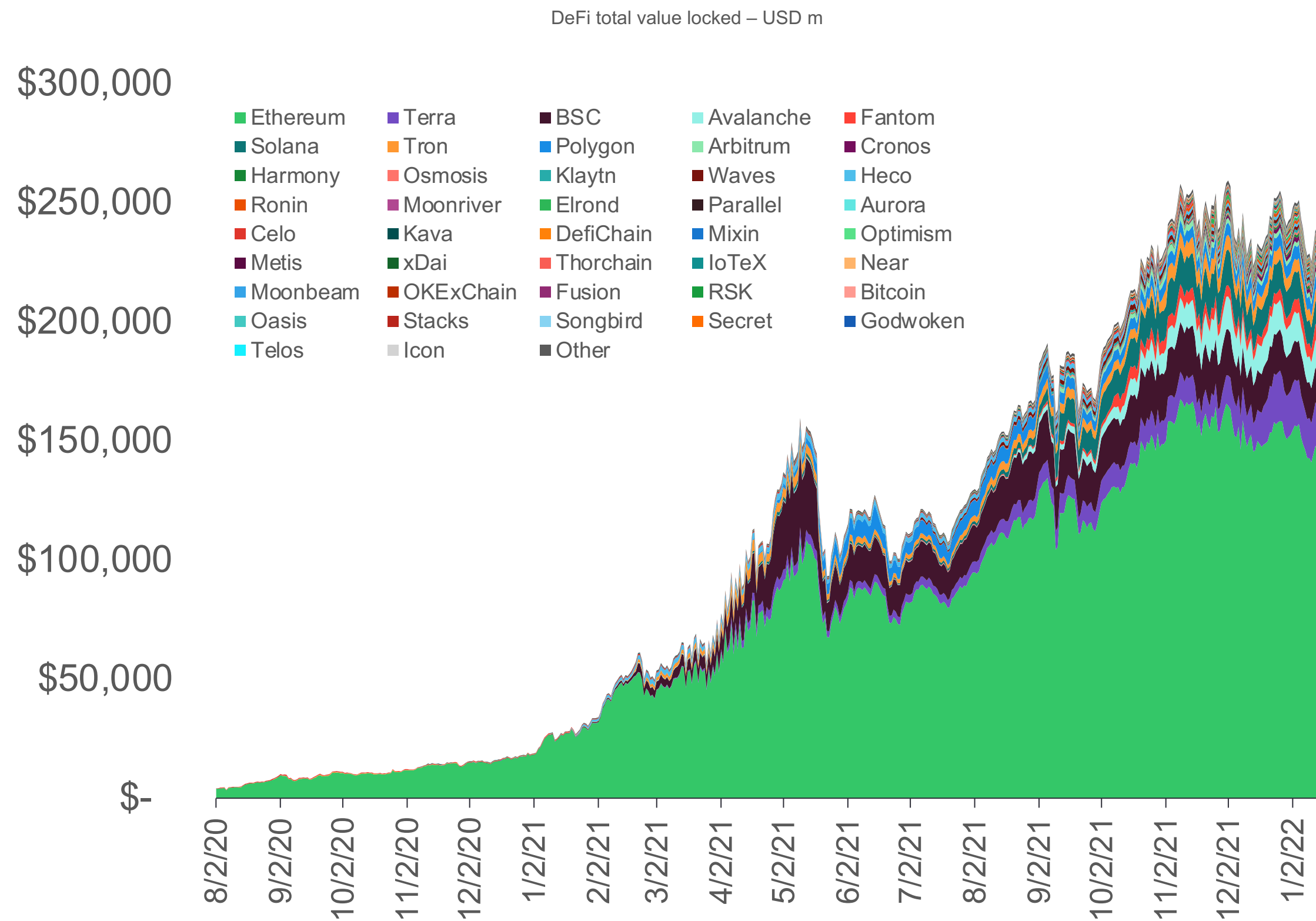
**Decentralized
finance (DeFi)**



**Decentralized autonomous
organizations (DAOs)**

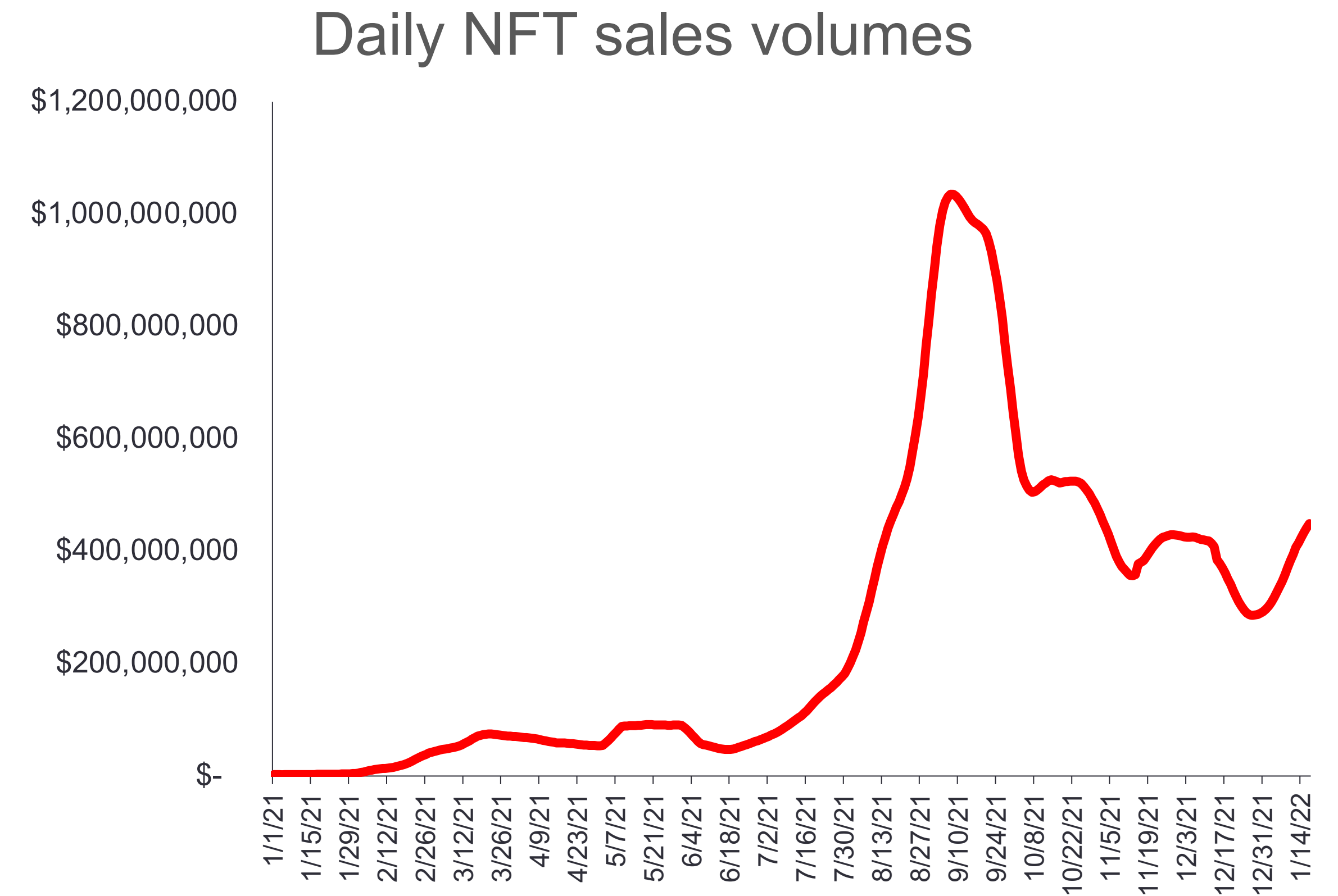
DeFi and NFTs in particular have been drawing users and companies into the markets for the last two years

The DeFi ecosystem is nearing \$300b in value

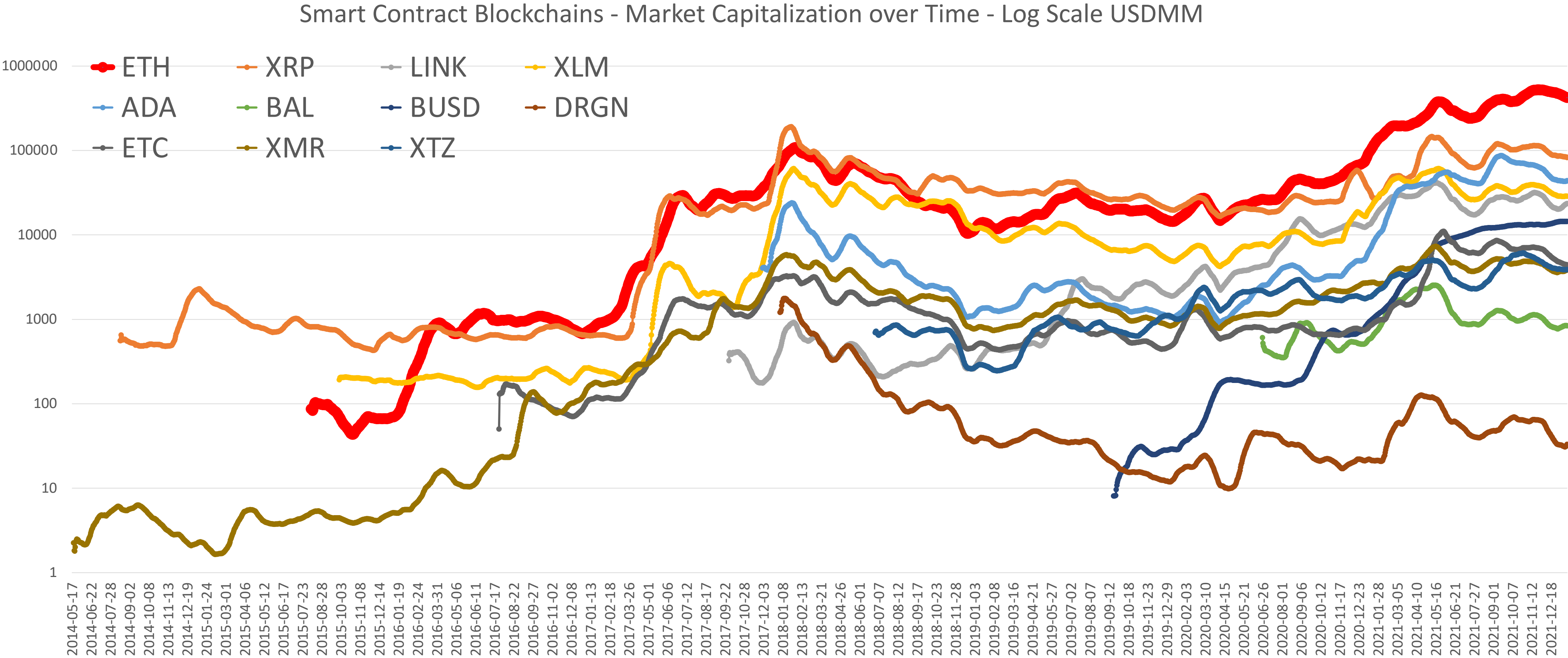


Sources: DeFi Llama and NonFungible.com

NFT sales often exceed \$500m daily



The blockchain ecosystem can feel exceptionally crowded, with many platforms competing for attention

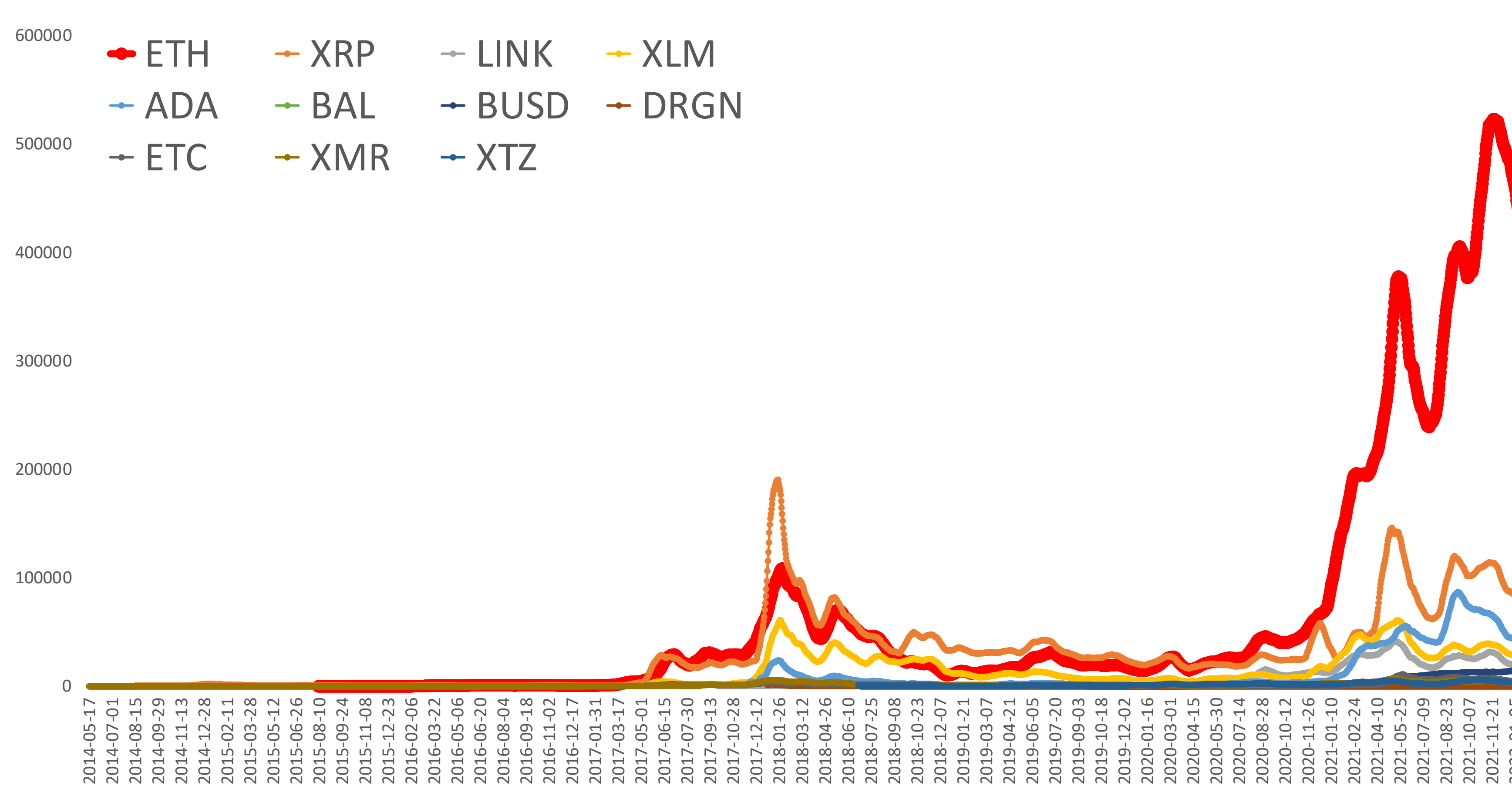


Source: Coinmetrics



In fact, Ethereum has become the dominant ecosystem platform

Smart Contract Blockchains - Market Capitalization over Time - Standard Scale USDMM



>95%
Of all NFT sales

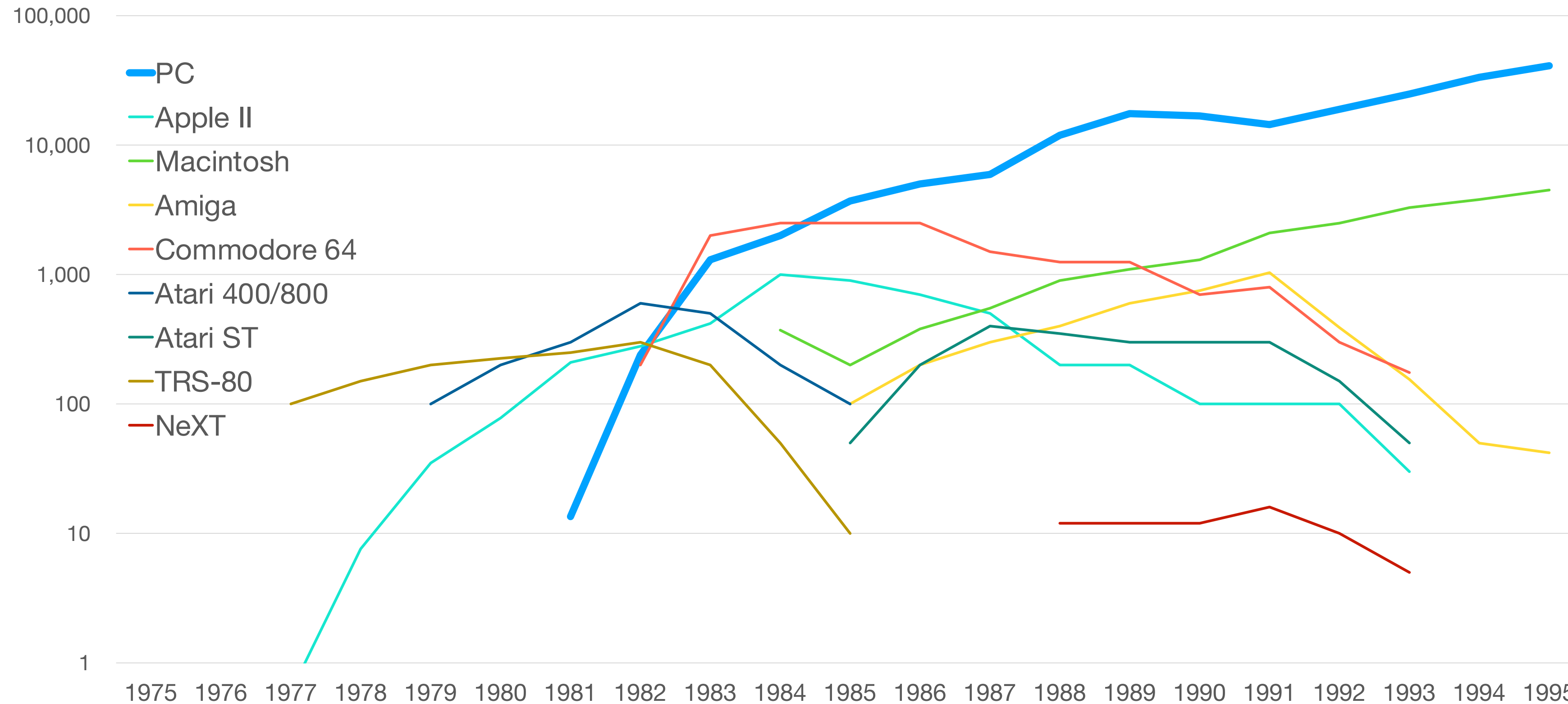
>70%
Of all DeFi capital

>3X
More devs than any other ecosystem

Source: Coinmetrics

Historical patterns of technology adoption look very similar, so let's take the case of PC

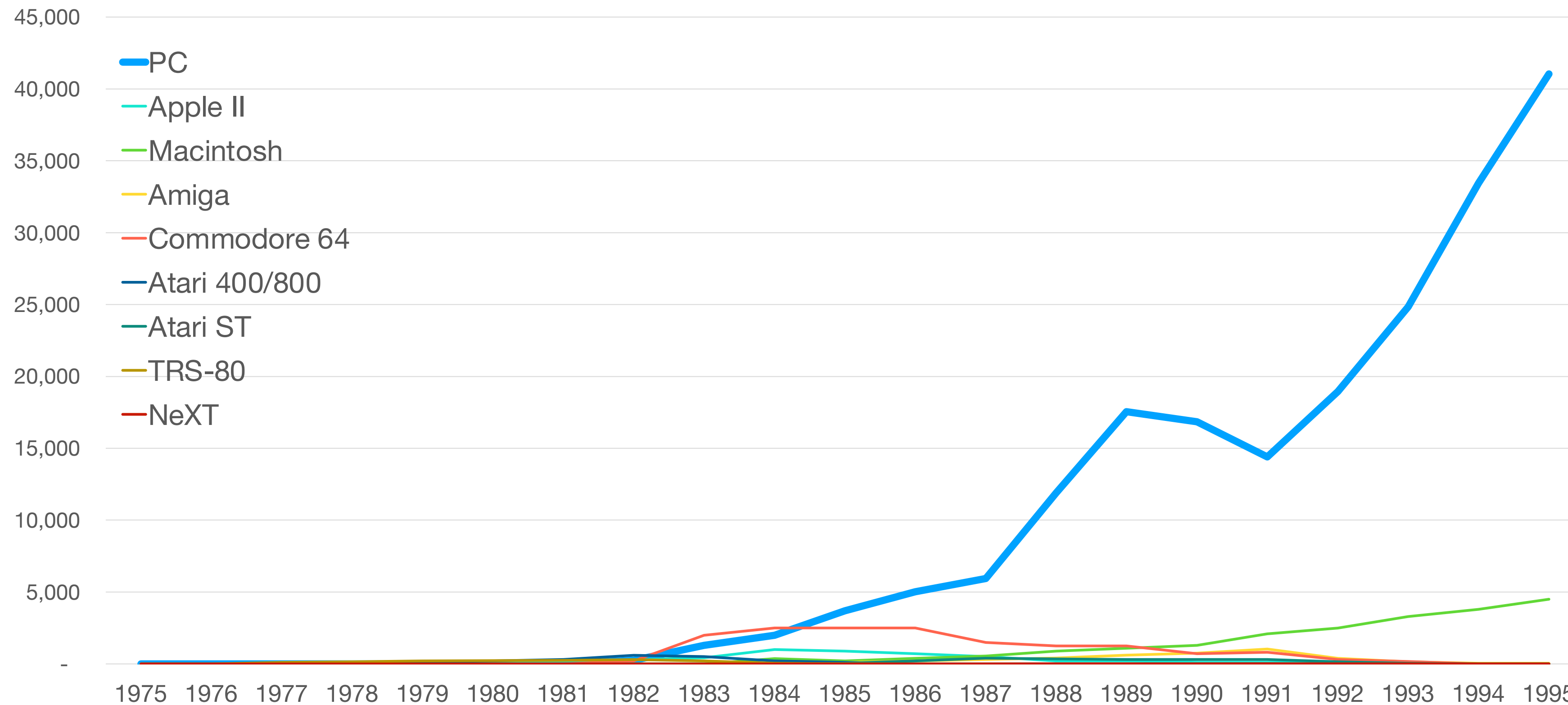
Shipments (000s) per PC platform – Log scale



- ▶ **Early stage ecosystems are characterized by lots of “churn” as people look for a winning platform.**
- ▶ People continue to launch new platforms even after the winner comes on scene.
- ▶ Mass adoption boosts everyone at first, but secondary platforms usually lose traction over time.

Key takeaways from PC and mobile: the battle for platform leadership was over *before* widespread adoption

Shipments (000s) per PC platform – Log scale

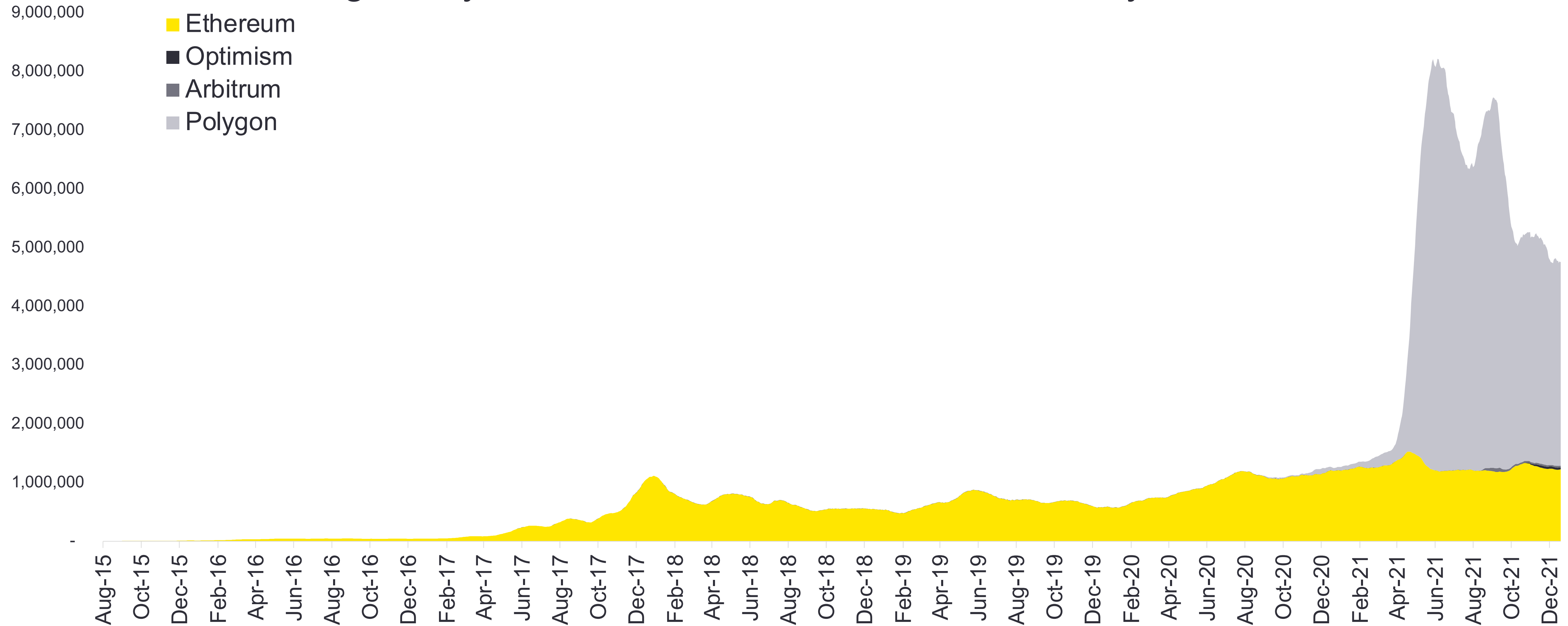


- ▶ **Same data, but now without the log scale, it's very clear that the PCs ushered in the era of mass adoption.**
- ▶ Exponential growth of the entire market and industry standards go hand-in-hand.
- ▶ Almost 30 years later, Windows PCs are *still* the dominant standard.
- ▶ Looks the same in mobile as well, with Android the winner.

Source: Asymco.com

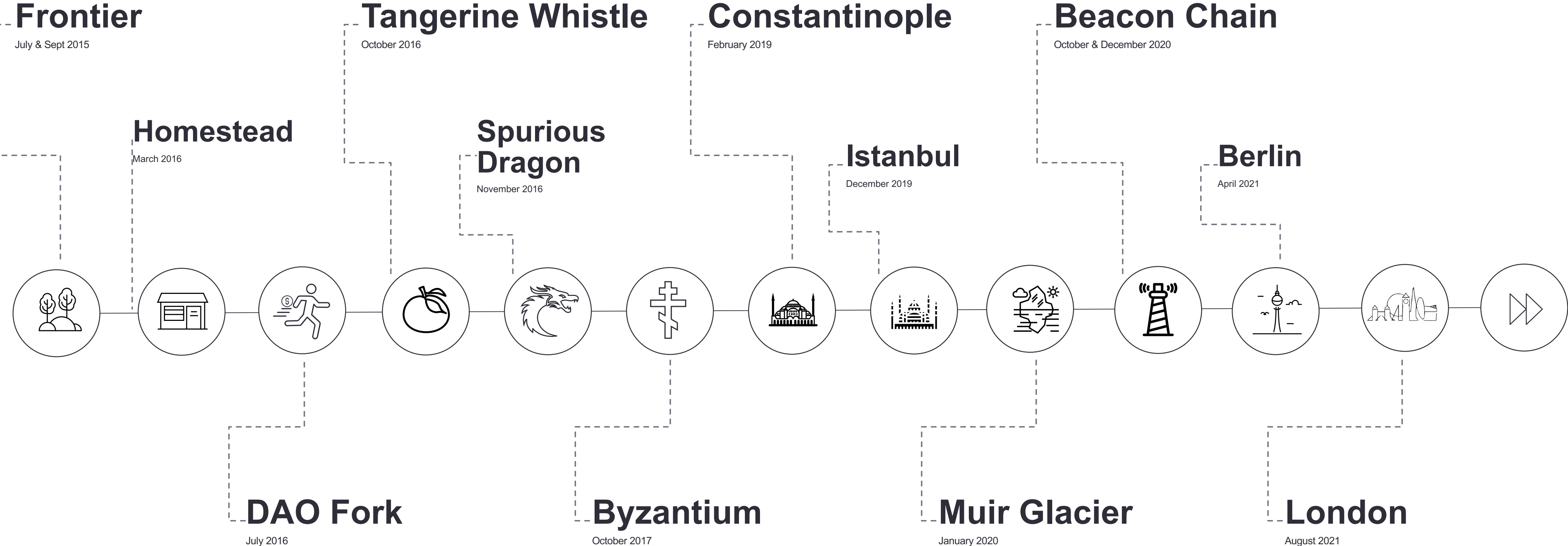
Scalability concerns are being addressed by Layer 2 networks

Average daily transaction volume on Ethereum Layers 1 and 2



Source: Messari, Coinmetrics, EY Analysis

Ethereum ecosystem is demonstrating all the process maturity you expect from essential infrastructure

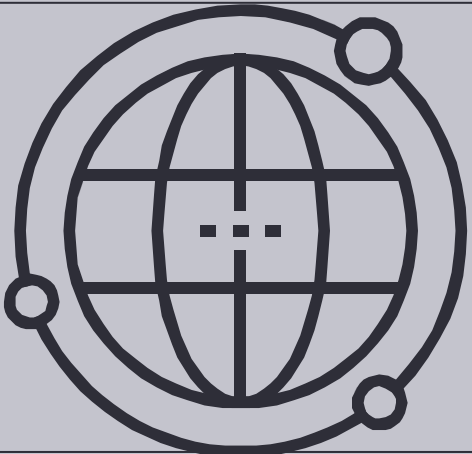


The Internet standardized on TCP/IP, blockchain ecosystems are likely to standardize on Ethereum.

▶ The internet used to connect all kinds of different networks.

Token Ring XNA SNA SNA

The Internet – TCP/IP
Transmission Control
Protocol/Internet Protocol

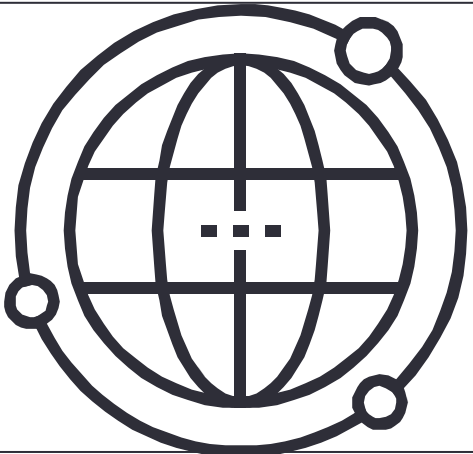


DECnet Netware VINES X.25

▶ Now it mostly just connects TCP/IP networks to each other.

IPv6 IPv6 IPv6 IPv6

The Internet – TCP/IP
Transmission Control
Protocol/Internet Protocol



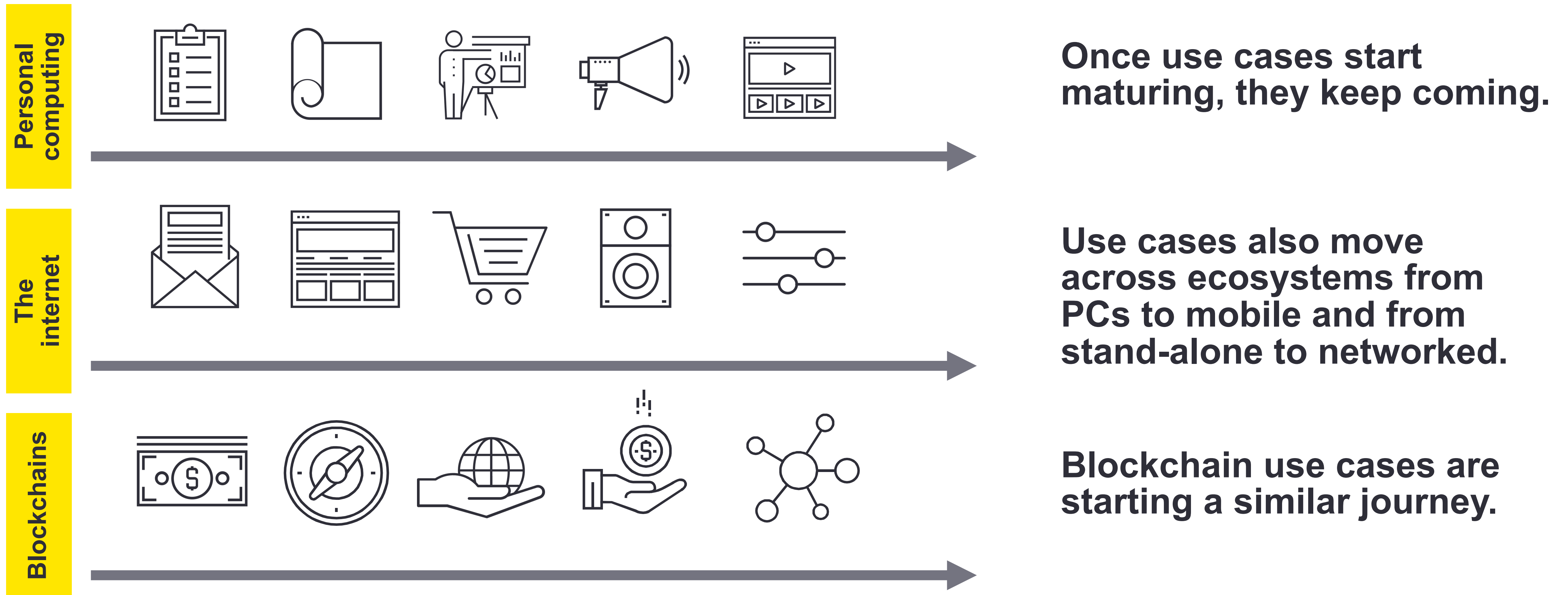
IPv6 IPv6 IPv6 IPv6

Agenda

- 01 The market has changed
- 02 **New market, new rules**
- 03 How to play
- 04 Thinking ahead



Even when the period of platform churn is over, the race for use case leadership goes on (and on and on ...)



NFTs and cryptocurrencies are the most mature use cases right now and will be moving into mainstream adoption

| Business opportunities | 2022 | 2023 | 2024 | 2025 | 2026 and beyond |
|-----------------------------------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|-----------------|
| Cryptocurrencies and NFTs | Maturing and widespread Most major banks and financial institutions | | | Market reaches saturation (>75% of all relevant institutions and clients adopted) | |
| DeFi and stablecoins | Accelerating quickly for consumers Early adoption phase in business | | Mainstream adoption in enterprise and banking begins | | |
| Supply chain traceability | Entering widespread adoption | | Mature, widely available/routine for enterprises to track supply chain operations | | |
| Business contracts and payments | Business-to-business (B2B) pioneers | Early adopters with a supply chain or financial focus | | Spread to all business process areas | |
| Embedded supply chain finance and operations | B2B pioneers | Early adopters with a focus on supply chain/receivables | | Fully integrated | |
| Integrated tax and compliance services | Capital gains Global trade origin | Governments start to set standards for blockchain-based, fully digital trade | | Automated/routine inclusion of tax calculation and payments | |



Evolution of blockchain services will be like the internet, only faster

Digital building blocks

Technology building blocks that came into being independently but could be used together

Predictable results

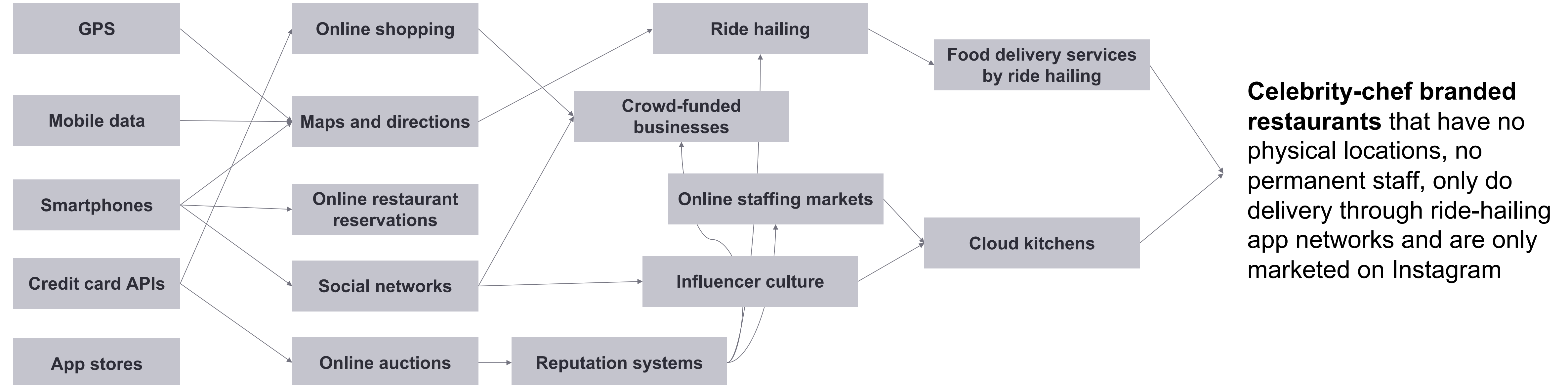
The ability to link these together initially produced very predictable results – things done online as they were offline

Accelerating disruptions

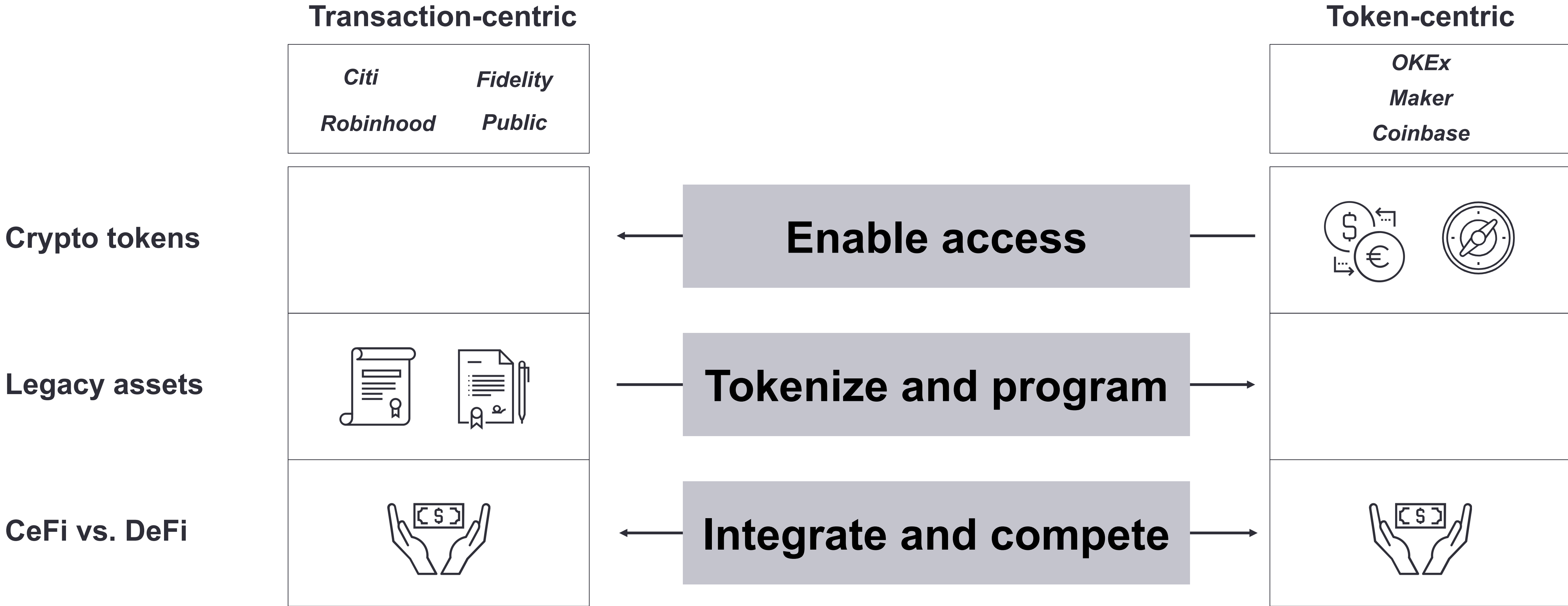
APIs (application programming interfaces) make it possible to start building “composite” models that layer one innovation atop the other

On nobody’s bingo card

Eventually leading to some very unpredictable end results ...



DeFi is starting to look like real competition to the existing financial services infrastructure



Permissionless, decentralized and interoperable: the keys to explosive growth and innovation

Decentralized

Interoperable

Permissionless

Why

More likely to evolve into a level playing field

No central operator with the power to change the rules or encroach upon market opportunities

Easily build on the foundations laid by others

Ready supply of assets and services

Integrate assets built by others and do so without permission

Internet analogy

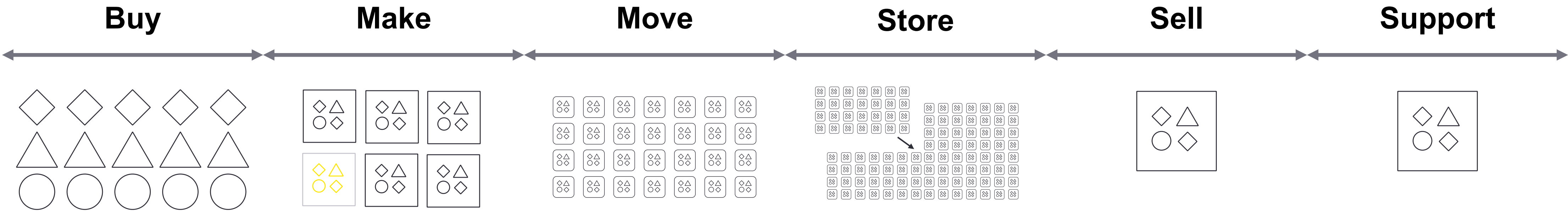
Set up your own shop or sell through a digital marketplace

Custom integration with every credit operator or a single standard for payments

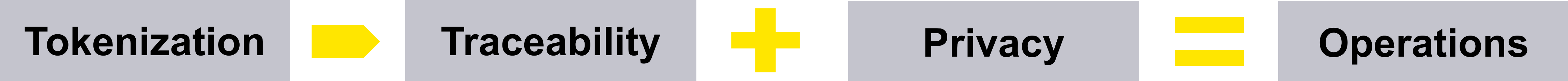
Send email to anyone or get permission to integrate to a closed messaging network

In supply chains, traceability and operational data are coming together starting this year

Tokenization is an ideal model for managing supply chains because it enables both traceability and forces reconciliation across silos:



Historically, only half the use case, the traceability component, could be deployed on public blockchains. In 2022, privacy-enabled systems will change that equation:



Regulatory uncertainty looks high right now, but it is likely to decline in the coming year, with positive consequences

UK Outlines Plan for Stablecoins and a Central Bank Digital Currency

The Treasury Department is drafting a proposal to regulate stablecoins along with research on CBDC.

 [Bilal Jafar](#) | [Regulation \(Cryptocurrency\)](#) | Tuesday, 10/11/2020 | 08:59 GMT+2



Photo: Bloomberg

[Share this article](#)    

1 Source: UK outlines...:
<https://www.financemagnates.com/cryptocurrency/regulation/uk-outlines-plan-for-stablecoins-and-a-central-bank-digital-currency/>



OCC approves the use of stablecoins for banking transactions

05 January 2021

 6  21  3 

Top US banking regulator, the Office of the Comptroller of the Currency, has approved the use of stablecoins for the settlement of financial transactions by banks.

2 Source: OCC...<https://www.finextra.com/newsarticle/37209/occ-approves-the-use-of-stablecoins-for-banking-transactions>

- ▶ Fear of crypto displacement seems to drive central bank digital currency (CBDC) thinking, not compelling use cases.
- ▶ Security fears will keep central banks from enabling programmability, and they will also want to avoid competing with the commercial banking infrastructure.
- ▶ Regulated stablecoins will accomplish the same goals without the same issues.

CBDC pilots are likely to disappoint users and policymakers

CBDCs are a global case of FOMO (fear of missing out):
CBDC countries by stage

41 Research

14 Pilots

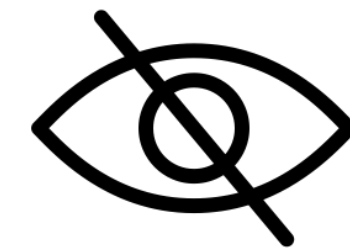
9 Launched



Early launches give a sense of what to expect in first rounds:



Centrally managed



No privacy guarantees



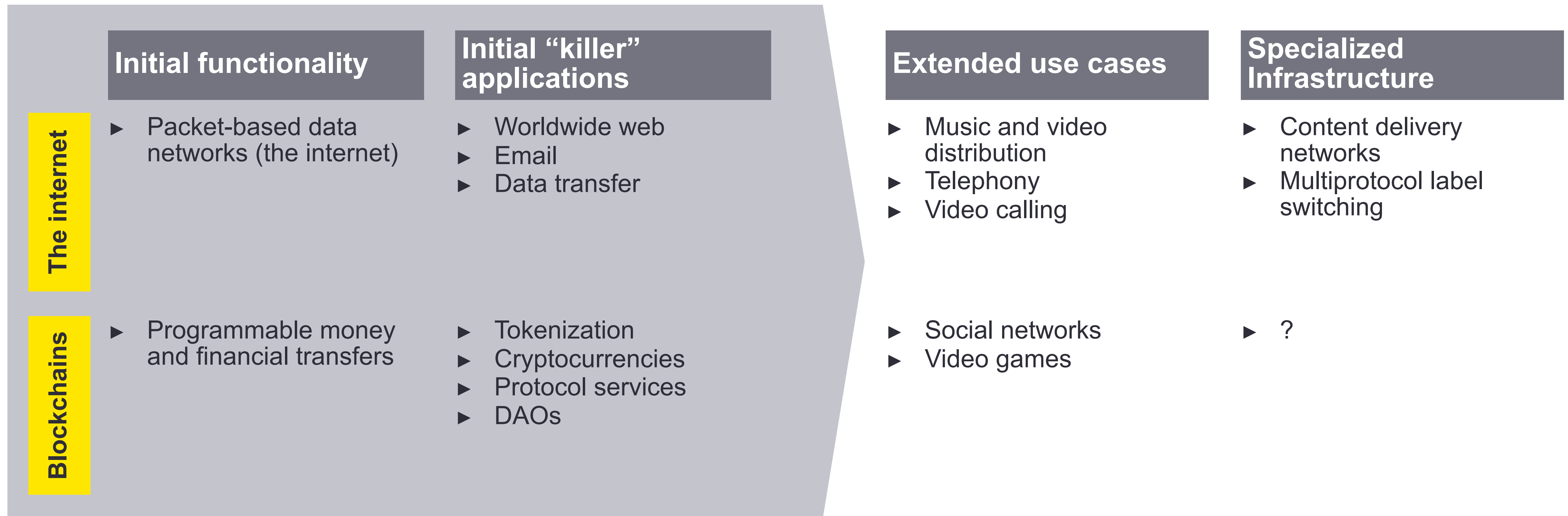
Non-programmable

In their early formats, CBDCs are unlikely to represent a viable alternative to private stablecoins running on public networks.

Effectiveness trumps efficiency in the use case scaling discussion – the best platform is the one everyone has

Early use cases that are extremely well matched to the technology drive adoption:

Later on, the networked and installed base becomes more valuable than a perfect fit:



Agenda

- 01 The market has changed
- 02 New market, new rules
- 03 **How to play**
- 04 Thinking ahead





**There's no compression
algorithm for experience.**

2022 is the end of the beginning



Three mistakes companies are making in this market and how to fix them



1

Stop trying to find the right platform
→ start building on Ethereum

2

Stop benchmarking your legacy
competition → start benchmarking
blockchain natives

3

Risk of doing < risk of not doing

We have five core product and service offerings



Assurance

Financial statement audit across multiple blockchains (public and private)

Attestation services

System and organization controls (SOC) reporting

Audit readiness

IPO readiness



Consulting

Business strategy

Solution design and system implementation

Process design

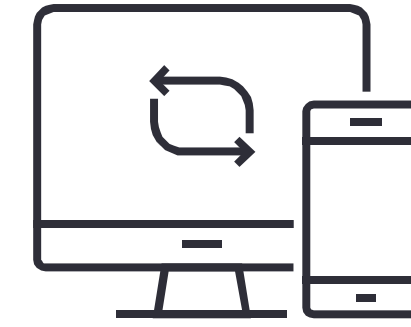
Regulatory compliance design



Tax advice

Tax calculation and assessment

Business design/location/structuring assessments and recommendations



Applications

Blockchain analytics

Supply chain and public service applications

Smart contract security



Research

Cryptography

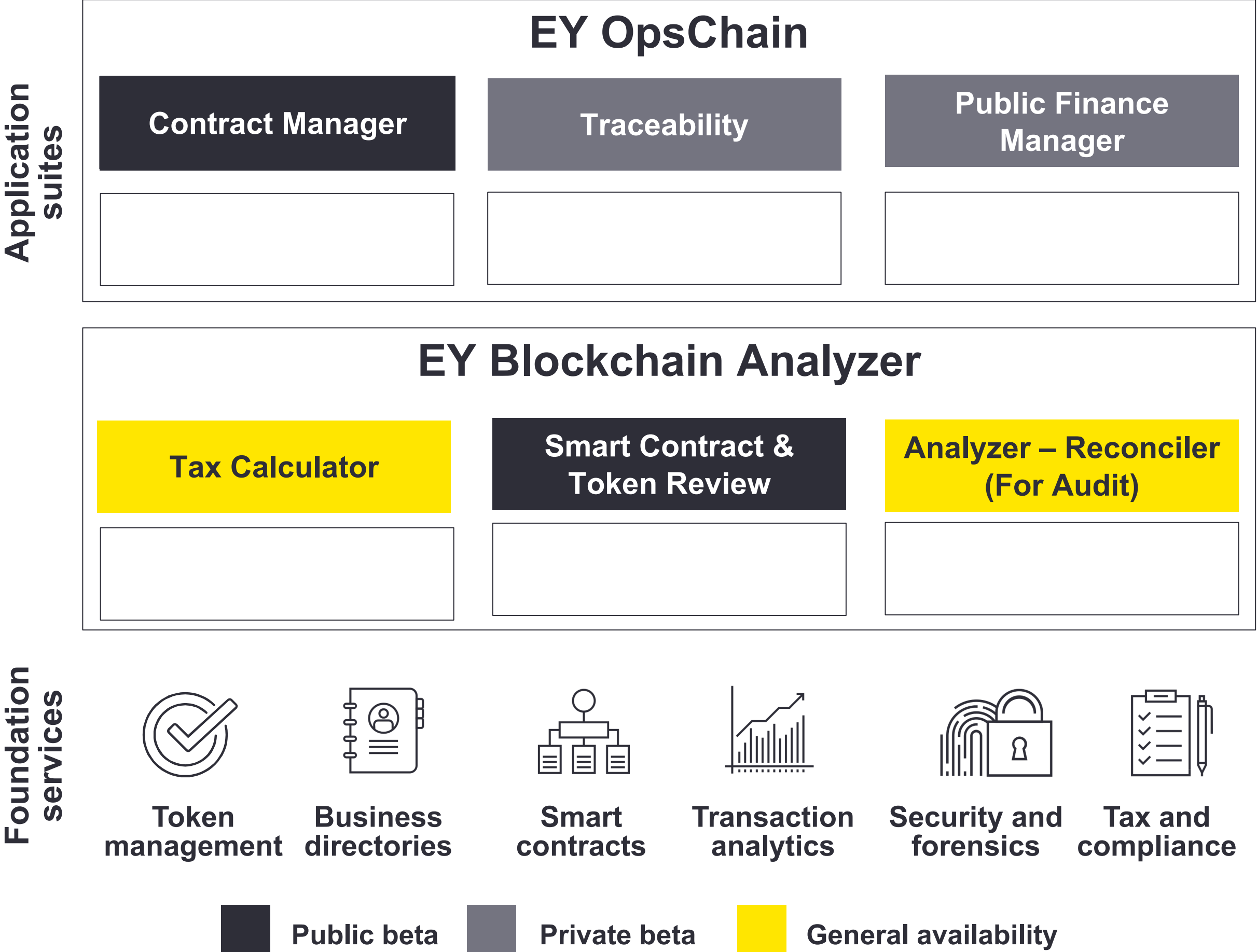
Privacy

Scaling

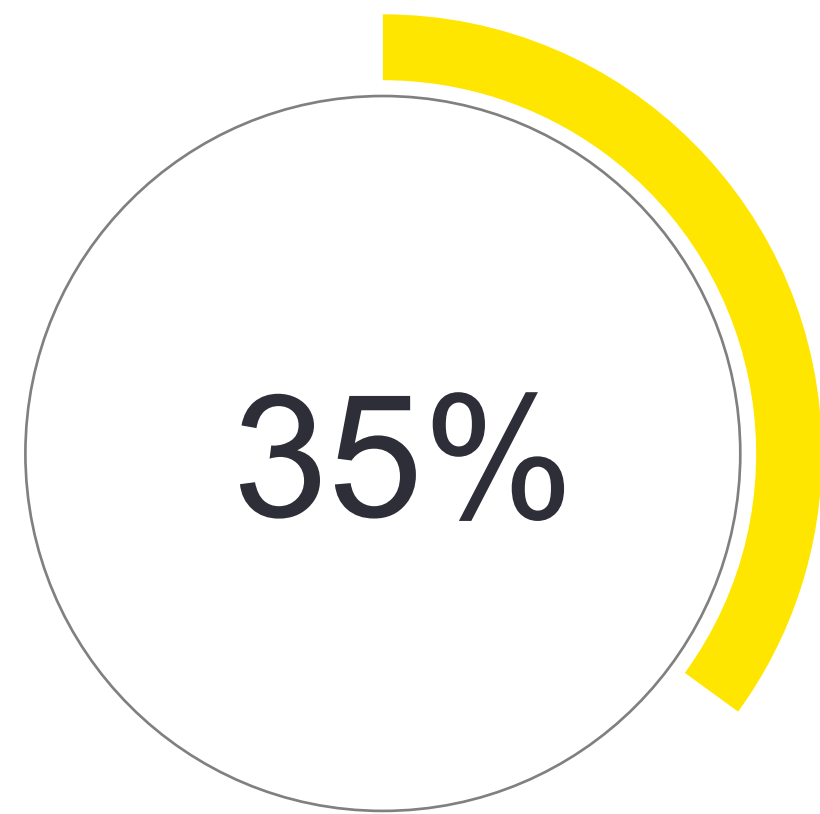
We have consolidated our technology onto a single platform: blockchain.ey.com

blockchain.ey.com

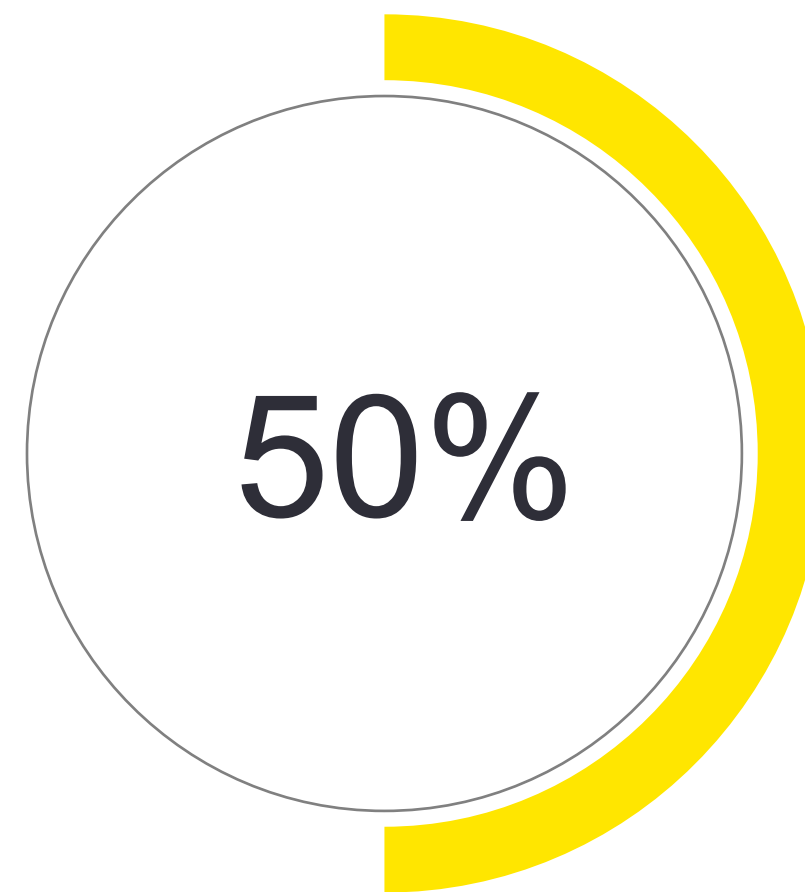
- Shared infrastructure for delivering our digital products
- Designed to enable integration across solutions
- Reusable digital components
- Common user interface
- Shared payment, subscription and user management service
- Organization management service
- Application programming interface access to high volume enterprise integration



EY Blockchain Analyzer is our solution for financial statement audit, a business that has been growing >100% annually



Of the top 20 crypto exchanges



Of the top 10 crypto custodians

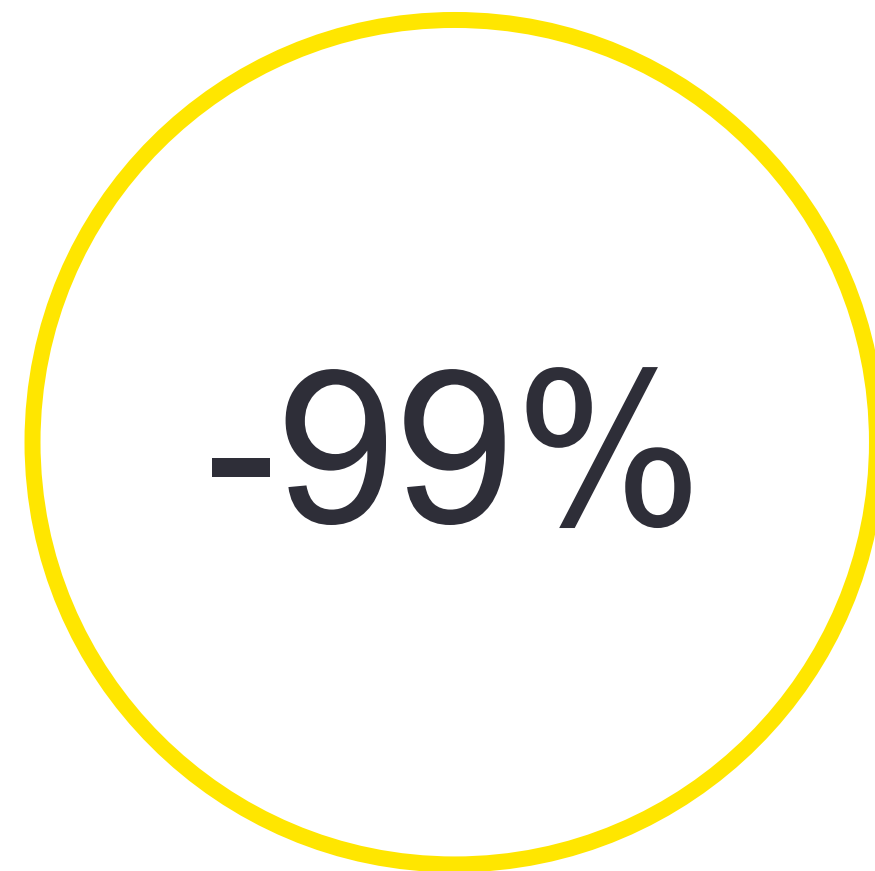
Financial statement audit support
Smart contract testing
Audit readiness
IPO readiness
Forensic analysis
Attestation and SOC reporting

EY firms have more than 6,000 clients in banking and capital markets. We expect blockchain adoption rates to reach 50% in the next few years.

With EY OpsChain, we have built a business around supply chain and business operations with many companies

Case example: Microsoft's expected benefits from implementing a blockchain-based solution for gaming rights and royalties management for its Xbox video game network

Less time needed to calculate rights and royalties owed



From 45 days to <4 minutes to complete statements of account

Less cost to administer the entire system



Reduction in the cost to administer the system

Full transparency for reduced litigation risk



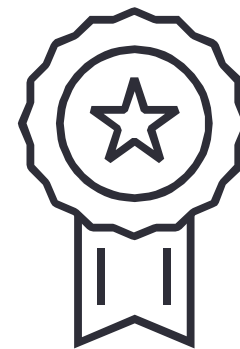
Increased trust by sharing transaction details and related business logic between parties

We delivered more than 8,000 New Year NFTs with EY OpsChain on the Polygon Layer 2 network

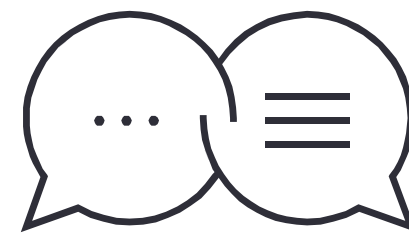


The EY Blockchain 2022 NFT has no monetary value and is solely intended for personal, non-commercial use

From idea to execution in under three weeks, we delivered our new year's greeting



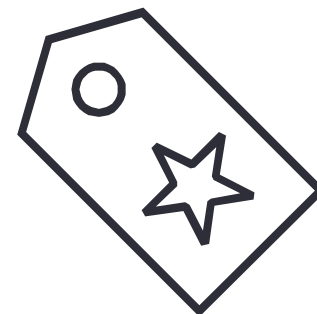
EY art competition



Friendly to non-crypto users



Security best practices



Low-cost execution on Polygon

Our smart contract testing solution is designed to allow companies to test contracts before they use them

Smart contracts can move money and assets automatically



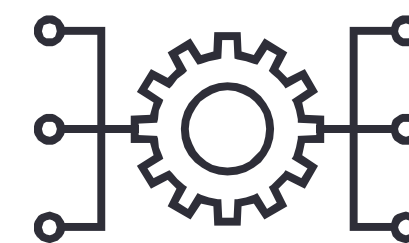
The EY Smart Contract & Token Review tool allows firms to manage risk in using these contracts:



Set up standard tests of functionality



Use libraries of pre-built tests



Develop and share tests across the organization

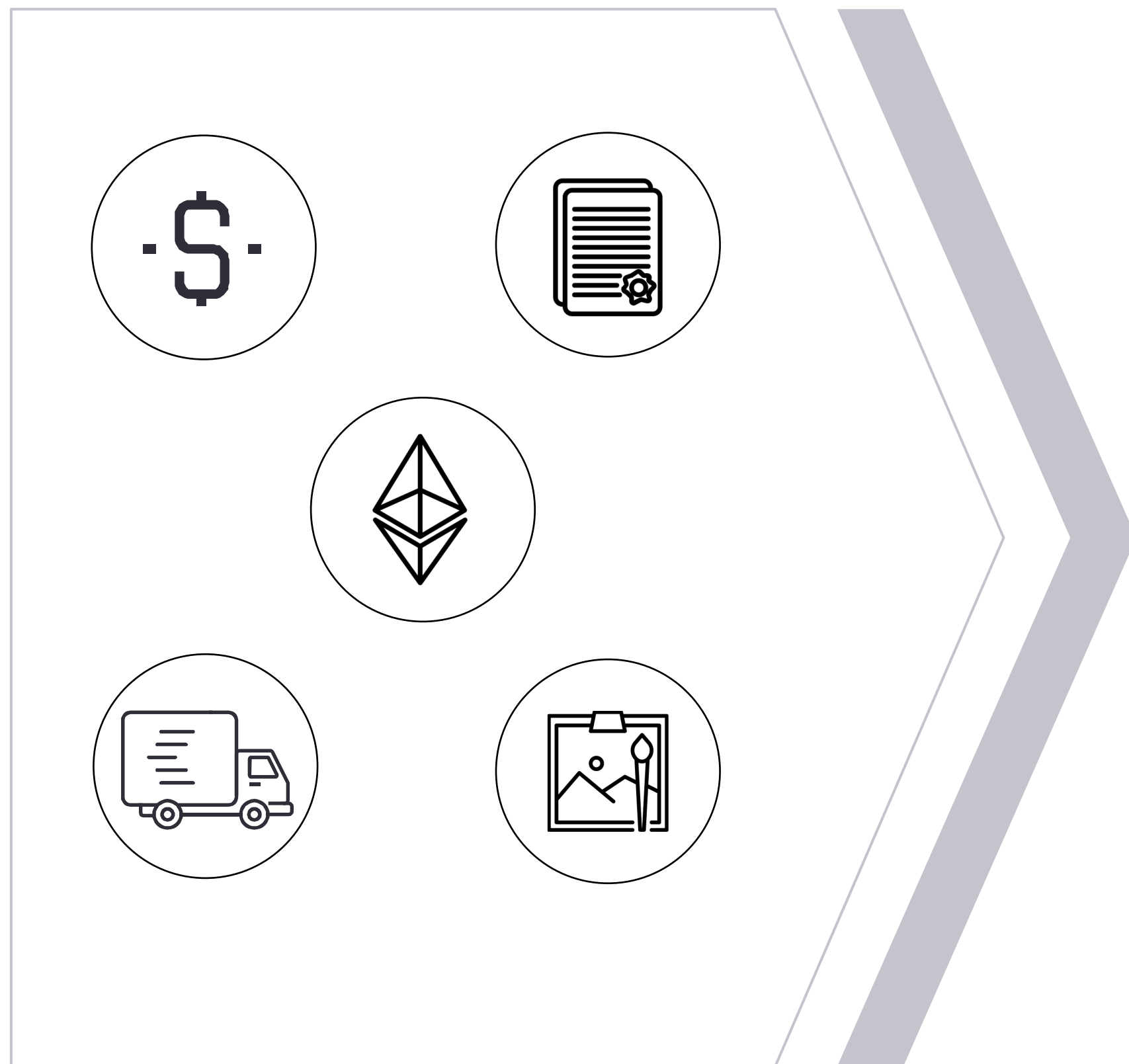


Simulate transactions before on-chain execution

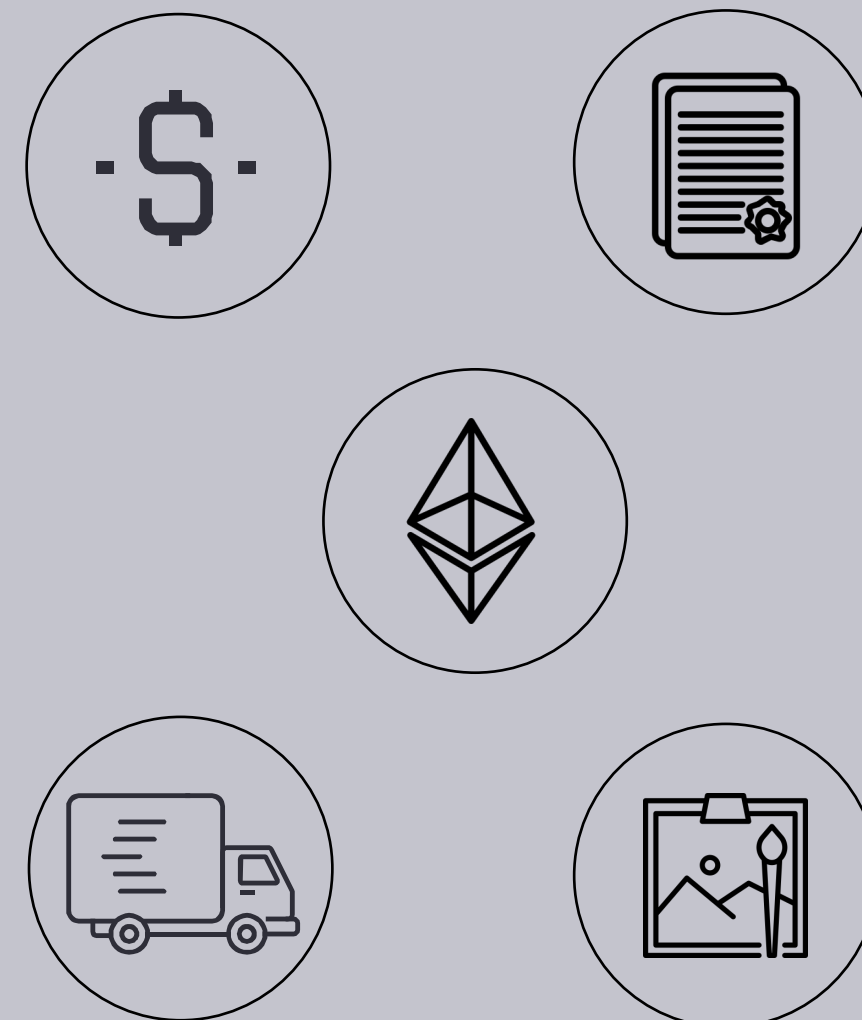
Polygon Nightfall is a privacy-centric Layer 2 network built on technology developed by EY for enterprise users

Take any ERC-20, 721 or 1155 on Ethereum

Transfer to others with full privacy

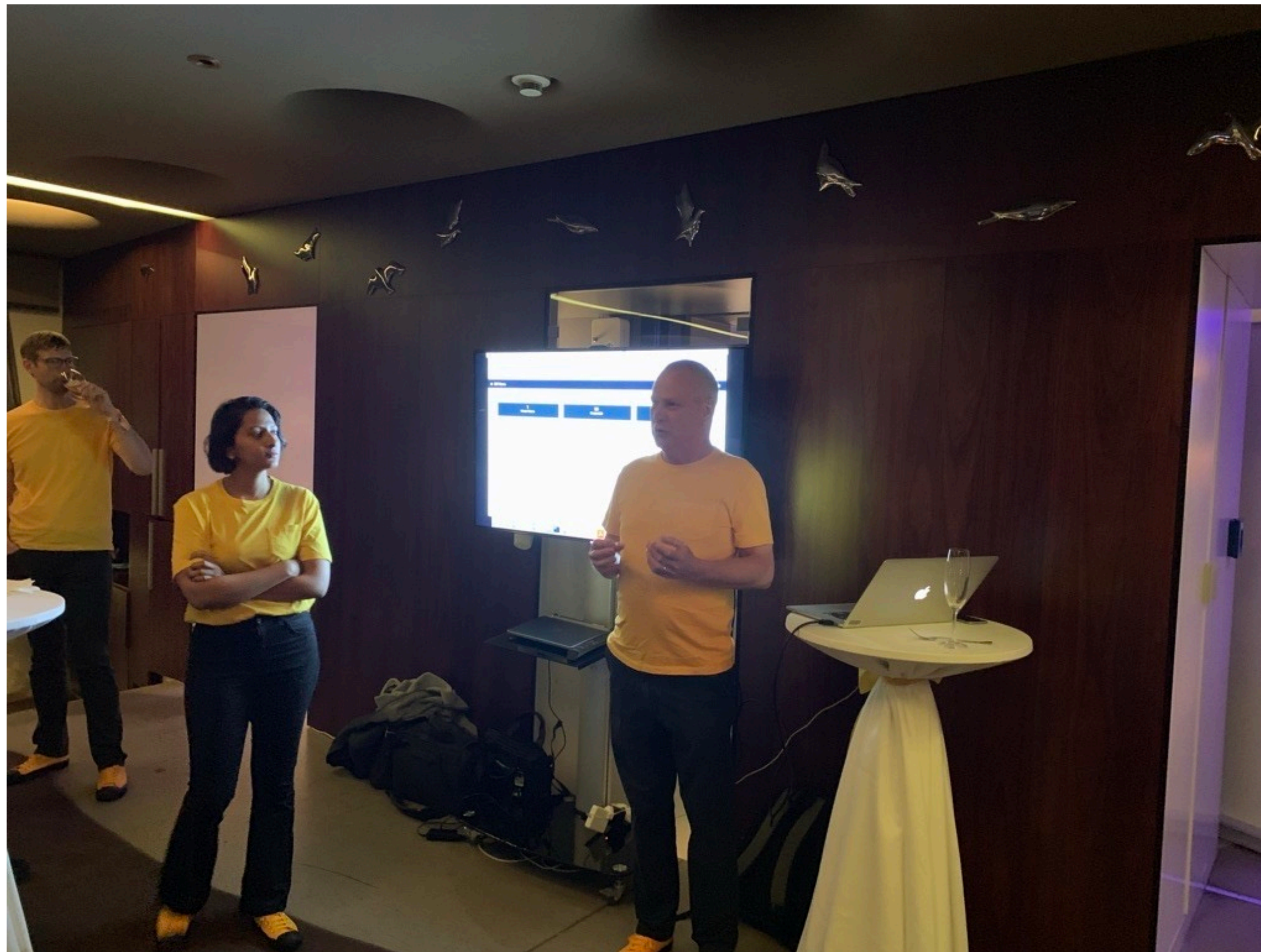


 **polygon** Nightfall



- ▶ Provable transaction history for audits
- ▶ Multiple validators from Polygon ecosystem
- ▶ Industry-leading transaction costs
- ▶ Running on Ethereum test-net now

We've worked through difficult challenges along the way, including that everything will take longer than you expect



- ▶ Started working on blockchain privacy in 2017
- ▶ First version released at DevCon in 2018
- ▶ Repeated improvements on the math and the underlying infrastructure
- ▶ Regulatory compliance tools
- ▶ Assurance and audit tools
- ▶ University cooperation

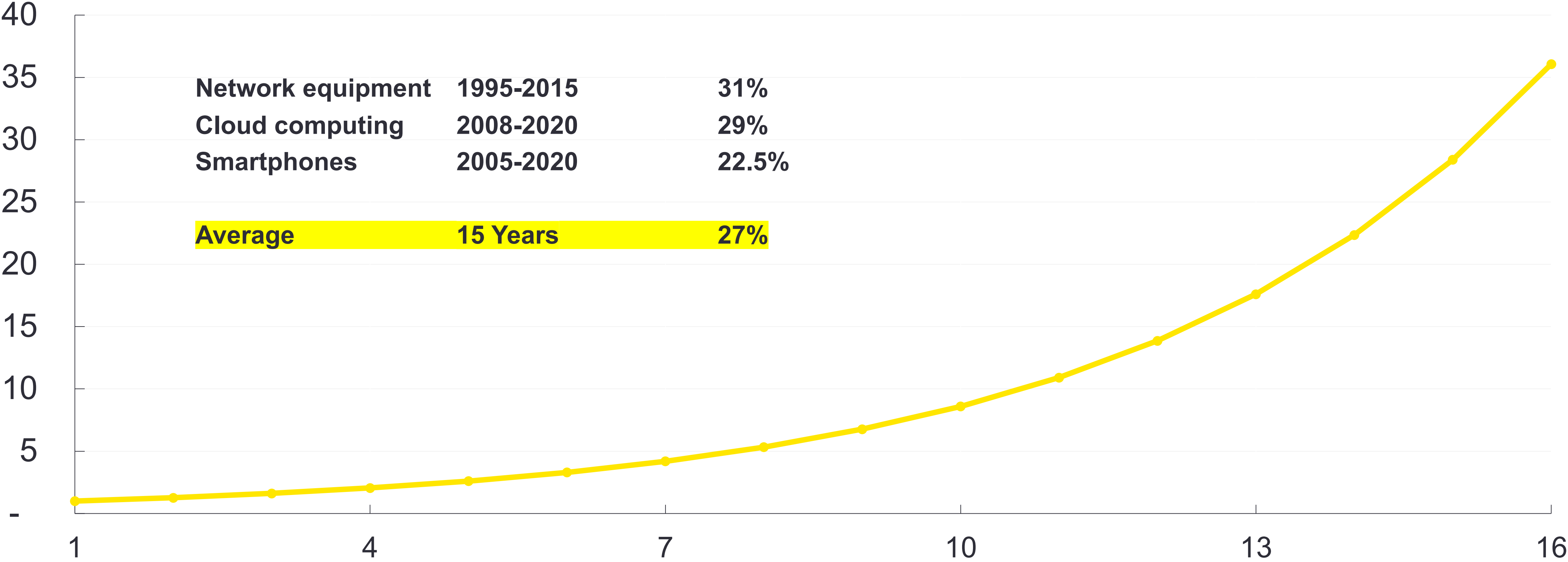
Agenda

- 01 The market has changed
- 02 New market, new rules
- 03 How to play
- 04 **Thinking ahead**



People are not good at thinking about scale, but when tech ecosystems reach mainstream adoption, the numbers are big

Growth index over years



What does 27% annual growth look like over the next 15 years? Large enough to reset the global financial industry

| | Today | In 2030 | In 2037 |
|--------------------------------------------------|------------|-------------|----------------|
| Blockchain market cap | \$3t | \$20t | \$108t |
| Average Daily DEX Volume | \$4b/day | \$25b/day | \$135b/day |
| Centralized Exchange Revenues¹ | \$40b/year | \$250b/year | \$1.3 trn/year |
| Ethereum Ecosystem Tx Volumes | 5m /day | 34m /day | 180m /day |

1: Based on market share for top 5 exchanges per CoinMetrics.com and an estimate of current exchange revenue.

One thing that won't change is the importance of taking and holding an early leading position in use case markets

| | Market Invented | Market Leader Since |
|-------------------------------------|------------------------|----------------------------|
| Enterprise Network Equipment | 1976 | 1995 |
| Personal Computers | 1974 | 1985 |
| Smartphones | 1992 | 2011 |
| Social Media | 1997 | 2008 |
| Cloud Computing | 1997 | 2006 |
| Office Productivity Software | 1981 | 1993 |
| ERP Systems | 1992 | 1992 |
| ICE Cars | 1886 | 1931 |

EY | Building a better working world

EY exists to build a better working world, helping create long-term value for clients, people and society and build trust in the capital markets.

Enabled by data and technology, diverse EY teams in over 150 countries provide trust through assurance and help clients grow, transform and operate.

Working across assurance, consulting, law, strategy, tax and transactions, EY teams ask better questions to find new answers for the complex issues facing our world today.

EY refers to the global organization, and may refer to one or more, of the member firms of Ernst & Young Global Limited, each of which is a separate legal entity. Ernst & Young Global Limited, a UK company limited by guarantee, does not provide services to clients. Information about how EY collects and uses personal data and a description of the rights individuals have under data protection legislation are available via ey.com/privacy. EY member firms do not practice law where prohibited by local laws. For more information about our organization, please visit ey.com.

Ernst & Young LLP is a client-serving member firm of Ernst & Young Global Limited operating in the US.

© 2022 Ernst & Young LLP.
All Rights Reserved.

2106-3806532
ED None

This material has been prepared for general informational purposes only and is not intended to be relied upon as accounting, tax, legal or other professional advice. Please refer to your advisors for specific advice.

ey.com



Paul R Brody

Principal, Ernst & Young LLP

EY Global Blockchain Leader

@pbrody

[linkedin.com/ln/pbrody](https://www.linkedin.com/in/pbrody)