CIRCLE ON HOW TO MAKE DIGITAL FINANCE AS UBIQUITOUS AS THE INTERNET

MARA ON THE PHYSICAL BACKBONE UNDERPINNING DIGITAL INFRASTRUCTURE

BARCLAYS ON HOW TO INNOVATE WHILE STAYING TRUE TO TRADITION WITHIN FINANCE

DIGITAL ASSETS AND TOKENIZED FINANCE

IMPACT

AN FII INSTITUTE PUBLICATION

DIGITAL ASSETS AND TOKENIZED FINANCE

FII INSTITUTE
Future Investment Initiative Institute
Impact on Humanity

FACTS AND FIGURES

CRUNCHING THE NUMBERS

Understanding the scale of the opportunity in these two areas.

90+%
of central banks are exploring CBDCs in some form

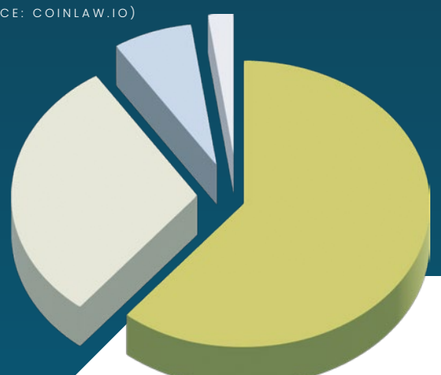
100+
central banks are engaged in CBDC work as of early 2025

(SOURCE: COINLAW CBDC STATISTICS 2026)

BREAKDOWN OF TOKENIZED ASSETS BY CLASS

- PRIVATE CREDIT **61%**
- COMMODITIES **7%**
- TREASURIES **30%**
- INSTITUTIONAL FUNDS **2%**

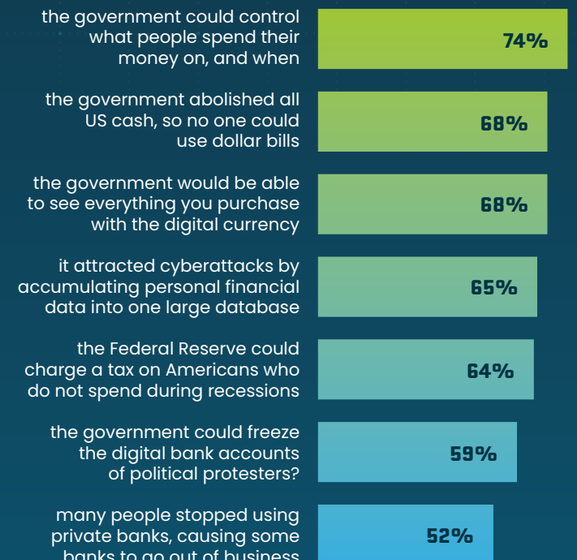
(SOURCE: COINLAW.IO)



MAJORITY OF AMERICANS WOULD OPPOSE A CBDC IF IT MEANT THE GOVERNMENT COULD SEE OR CONTROL THEIR SPENDING, IT ELIMINATED CASH OR IT ATTRACTED CYBERATTACKS

Would you support or oppose the federal government issuing a central bank digital currency (CBDC) if it meant ...

Percent who oppose CBDCs if it meant:



(SOURCE: CATO INSTITUTE, HTTPS://COINLAW.IO/CBDC-STATISTICS/)

$4 trillion
of real estate could be tokenized by 2035

(SOURCE: DELOITTE CENTER FOR FINANCIAL SERVICES, DIGITAL DIVIDENDS: HOW TOKENIZED REAL ESTATE COULD REVOLUTIONIZE ASSET MANAGEMENT, 2025)

$10 billion
in tokenized bonds have been issued by entities including Siemens, the World Bank and the City of Lugano

(SOURCE: MCKINSEY, TOKENIZED FINANCIAL ASSETS: FROM PILOT TO SCALE)

A NEW ARCHITECTURE OF VALUE

LIKE MANY PARTS OF OUR LIVES, THE GLOBAL FINANCIAL system is navigating a profound structural transformation – the most profound since the Renaissance era's introduction of double-entry bookkeeping. We are witnessing, in real time, the great replatforming of economic value, moving from siloed, analogue and electronic legacy systems to interoperable, programmable and tokenized infrastructures.

That is a fundamental reimagining of how value is created, stored, transferred and accessed worldwide. From the data centers of Texas to the mobile wallets of Senegal, from the trading floors of London to the remittance corridors of the Global South, digital finance and tokenized assets are rewriting the rules of economic participation.

At FII Institute, we recognize that this transformation brings both unprecedented opportunity and substantial challenge. The potential exists to unlock trillions in illiquid assets, to reduce settlement times from days to seconds, and to extend financial services to the billions who remain excluded. Yet so do the risks of fragmentation, instability and new forms of exclusion.

This is where FII Institute's role as a convener becomes essential. More than observers of this transformation, we are active participants – working to corral solutions, to bridge divides between traditional finance and digital innovators, and to ensure the benefits of this new architecture of value are widely shared.

This report explores the physical infrastructure that powers digital assets, the regulatory frameworks shaping their future and the real-world applications already widening access to finance in the Global South. As always, we invite you to engage with these ideas, to question assumptions and to join the debate. The architecture of value is being rewritten – and together, we can ensure it serves humanity.

COVER ILLUSTRATION: EUGENE MYMRIN/MOMENT RF/GETTY IMAGES, PHOTO: FII

Richard Attias
Chairman of the Executive Committee and Acting CEO, FII Institute

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Going mainstream

The rise of Bitcoin and other cryptocurrencies has hit the mainstream, including on billboards like this one in Times Square, New York City. The public face of the broader adoption of cryptocurrencies and digital finance.

PHOTO: MICHAEL NAGLE/BLOOMBERG VIA GETTY IMAGES

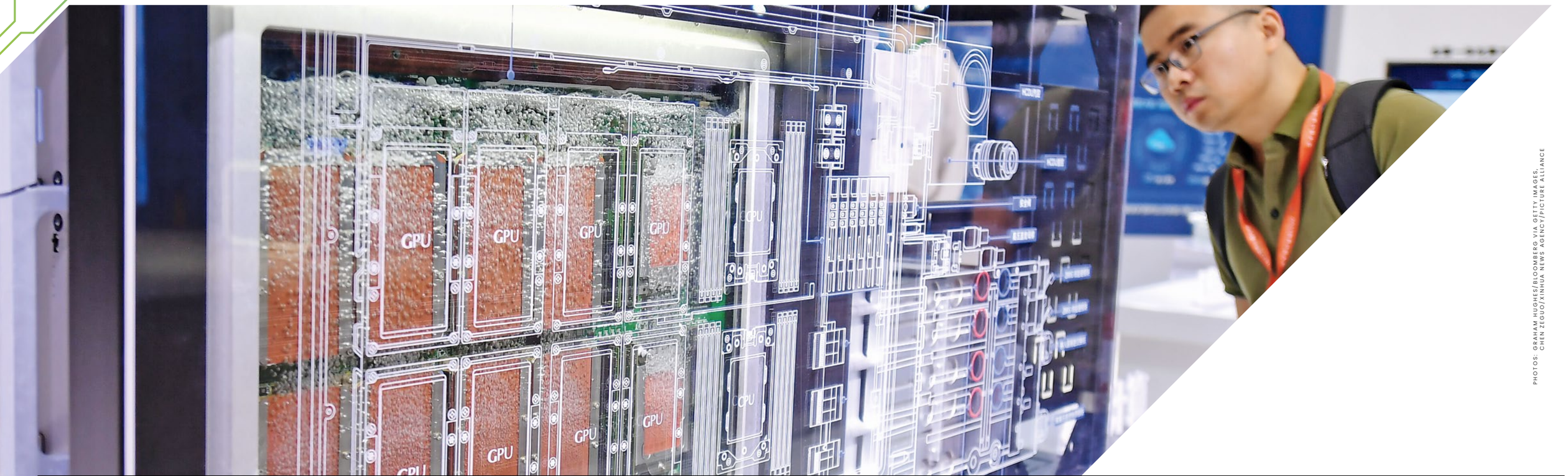
True adherents

Cryptocurrencies have been particularly popular in the Global South, because of the way they help users gain access to the financial markets. Events such as this one, held in El Salvador, help raise awareness.

PHOTO: JOSE CABEZAS/REUTERS

Physical infrastructure

While inherently digital, the requirements for physical infrastructure to mint and maintain cryptocurrencies will be vital as adoption increases. Policymakers must consider how to handle that challenge.



PHOTOS: GRAHAM HUGHES/BLOOMBERG VIA GETTY IMAGES; CHEN ZEGUO/XINHUA NEWS AGENCY/PICTURE ALLIANCE

THE TOKENIZATION TIPPING POINT

How the shift from speculative crypto to stable real-world assets is unlocking a multi-trillion dollar market.

SOMETHING'S AFOOT IN THE FIELD OF FINANCE. THE narrative of digital assets has shifted decisively. The era of crypto as currency – characterized by volatile tokens, speculative mania and promises of disrupting fiat money – is giving way to something far more consequential: tokenization as infrastructure.

Real World Assets (RWAs) – the digital representation of physical and traditional financial assets on a blockchain – are driving this pivot. Unlike the initial coin offering boom of 2017 or the DeFi summer of 2020, the current RWA surge is rooted in real, tangible economic value, including US Treasuries, real estate, corporate bonds and commodities.

The market implications are staggering. Forecasts for the tokenized asset market by 2030 range from $2 trillion to $30 trillion, depending on which analysts you choose to read. McKinsey & Company has a base case of $2 trillion, focusing strictly on financial instruments like mutual funds, bonds and loans. Standard Chartered and Boston Consulting Group project the market to grow between $16 trillion and $30 trillion, anticipating a fundamental restructuring of all value transfer, including the tokenization of illiquid physical assets.

But whatever the viewpoint and whatever the forecast, one thing seems clear: tokenization at its most basic is helping to make existing markets work better. But listen to the likes of Standard Chartered and BCG and it could be part of a complete reordering of financial markets, creating liquidity where none existed before.

THE WAVE WASHING ON SHORE

The first wave of tokenization is already underway. By late 2025, tokenized money market funds holding US Treasuries exceeded $8 billion in assets under management. These instruments serve as a high-yield, low-risk collateral primitive in DeFi ecosystems, replacing more volatile assets like Ether or Bitcoin. Institutions like BlackRock, Franklin Templeton and WisdomTree have all launched products in this space.

Tokenized treasuries are important because of how they're different to traditional money. Regular market funds offer yield for investors, but they sit siloed in brokerage accounts. Tokenised versions offer the same yield combined with the composability of DeFi, and can be used as collateral for borrowing, lent out in liquidity pools or moved 24/7 without settlement delays.

Tokenized commodities, such as Tether Gold (XAUT) and Paxos Gold (PAXG), are also increasing, reaching a market capitalization of $3.4 billion by Q4 2025. The sector grew 177% in 2025, outpacing physical gold growth by a factor of 2.6. But things are also changing in private credit and bonds. More than $10 billion in tokenized bonds have been issued by entities including Siemens, the World Bank and the City of Lugano. Tokenization reduces the cost of issuance and enables fractionalization, allowing broader investor access to previously exclusive asset classes.

Tokenized US Treasuries AUM:
> $8 billion (2025)

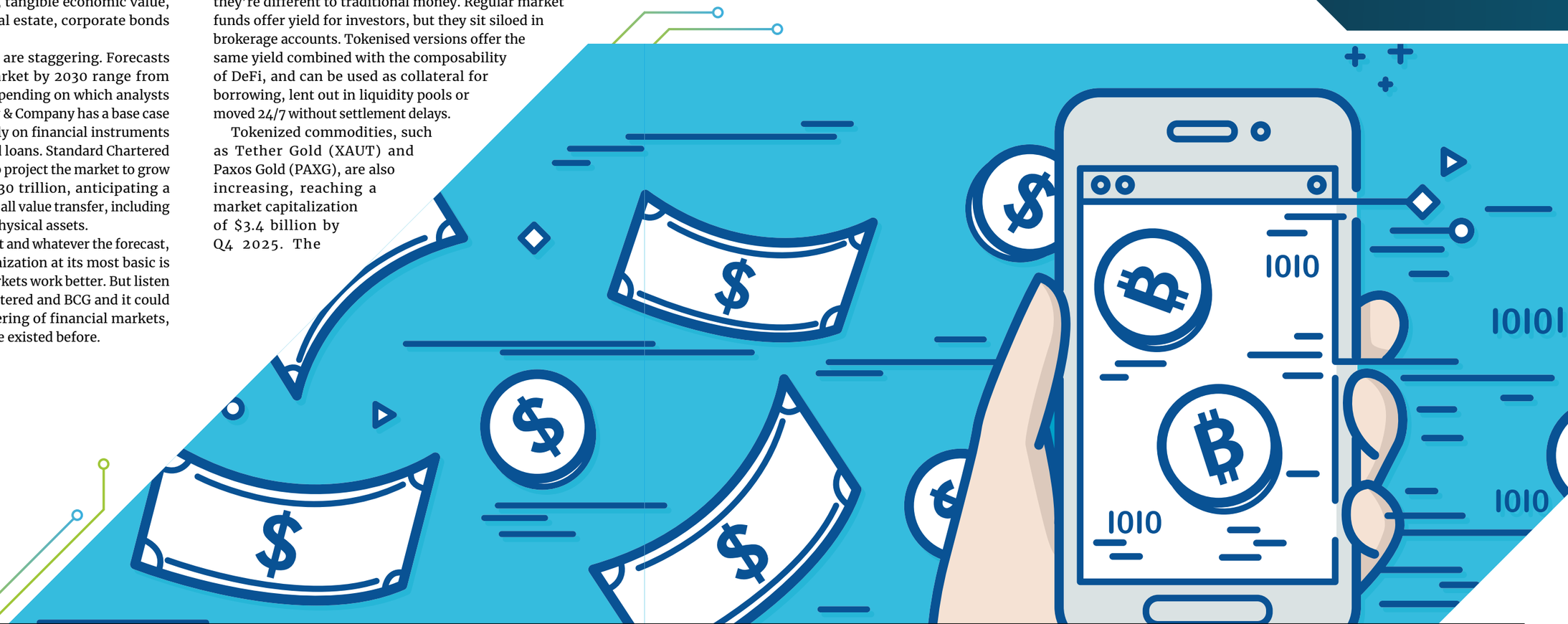
Tokenized gold market cap:
$3.4 billion (Q4 2025)

Tokenized bonds issued:
>$10 billion

RWA market projection (2030):
$2T – $30T

Real estate tokenization (2035):
$4 trillion projected

SOURCES: MCKINSEY & COMPANY, STANDARD CHARTERED, BOSTON CONSULTING GROUP, DELOITTE CENTER FOR FINANCIAL SERVICES, INDUSTRY REPORTS (2025)



The rise of smartphone apps and the embracing of digital finance means we're at a tokenization tipping point for society

ILLUSTRATION: MUSTAFAHACALAKI/DIGITALVISION VECTORS/GETTY IMAGES

THE ADVANTAGE OF NEW FINANCE

Innovative finance is helping users in a number of ways, showing that speed is of the essence.

T+2 (TRADITIONAL FINANCE)	T+0 (TOKENISED FINANCE)
Trade date plus two days for settlement	Instant simultaneous settlement
Capital trapped in clearinghouses	No capital trapped in intermediaries
Counterparty risk requires liquidity buffers	Smart contracts eliminate counterparty risk
Limited operating hours	24/7/365 operation

→ A REVOLUTION IN SETTLEMENTS

Perhaps the most profound innovation promised by tokenization is atomic settlement – the simultaneous exchange of asset and payment. Traditional finance operates on T+2 settlement cycles (trade date plus two days), which traps capital in clearinghouses and requires massive liquidity buffers to manage counterparty risk.

Tokenization allows for instant settlement, and the efficiency gains are substantial. McKinsey estimates this could unlock significant capital in repo markets, where trillions of dollars are turned over daily. But the benefits extend beyond efficiency.

Consider secondary market liquidity. By fractionalizing illiquid assets – a $50 million commercial building, for example – tokenization can reduce the illiquidity discount typically applied to private assets. Platforms exist like this for real estate, allowing investments as low as $50. The Deloitte Center for Financial Services predicts that $4 trillion of real estate could be tokenized by 2035.

The power of tokenization can help address one of the most persistent challenges in finance: the liquidity premium. Illiquid assets demand higher returns because investors cannot easily exit. By creating secondary markets for previously untradeable assets, tokenization could compress risk premiums across the economy.

THE INTERNET OF VALUE

The transformation unfolding represents a fundamental shift in how value is conceived and transferred. Just as the internet democratized information, tokenization has the potential to democratize access to financial assets.

A farmer in Kenya could own a fraction of a Manhattan office building. A small business in Brazil could access credit from a liquidity pool in Singapore. Or a retiree in Japan could invest in tokenised infrastructure projects in Africa. The old barriers of geography, accreditation status and minimum investment amounts are being destroyed.

However, the path to this isn't clear. Regulatory uncertainty, technological fragmentation and the need for market infrastructure all pose challenges. The singleness of money – the principle that a digital dollar issued by one institution must have the exact same value as one issued by another – must still be preserved.

All of this suggests that the tokenization tipping point offers us both an opportunity and an imperative. There's opportunity because trillions in value can be unlocked. But there's also imperative, because those who embrace this infrastructure transformation will shape the financial system of the future. The question is not whether tokenization will happen – it already is. The question is who will benefit.

ILLUSTRATION: MUSTAFAHACALAKI/DIGITALVISION VECTORS/GETTY IMAGES

AN ONGOING CONVERSATION

Debate about digital assets and tokenization has long been a staple of FII Institute discussions.

"We spend so much time talking about AI, but not enough about the tokenization of financial assets, and how quickly that can happen, and how soon we'll all have digital wallets."

LAURENCE FINK
Chairman & CEO, BlackRock, speaking at FII9

"[Stablecoins are] creating a new internet-based infrastructure for fiat currency."

JEREMY ALLAIRE
Cofounder, CEO & Chairman, Circle, speaking at FII9

"We don't have a global consensus on crypto because the use cases are still in extremely early stages. It's only been 16 years, and we'll be seeing those applications over the next 16 years."

BRAD GARLINGHOUSE
CEO, Ripple, speaking at FII9

"As we enter this era of digitized money powered by AI, we must recognize its dual nature: a tool that can be used constructively, abused by some, or mishandled by others. Vigilance is essential."

BILL WINTERS
Group CEO, Standard Chartered Bank, speaking at FII9

"My message to everyone when it comes to Bitcoin is that it's still early. It's the ultimate hard asset, and a combination of Bitcoin and gold will protect your savings from the global currency debasement that we're seeing."

RICARDO B. SALINAS PLIEGO
Founder & Chairman of the Board, Grupo Salinas, speaking at FII9

"As technology evolves, especially with tokenization, we need to find the right way to package these solutions so they become accessible and beneficial to everyone."

JENNY JOHNSON
President & CEO, Franklin Templeton, speaking at FII9

PHOTOS: FII

PHOTO: OSCAR WONG/MOMENT RF/GETTY IMAGES

TRUST AND SECURITY

Everyone wants and needs trust when talking about their finances. So as tokenization and digital assets move from experimental to essential, the question of how to build secure, reliable and trustworthy infrastructure becomes paramount. The transformation is underway. The question now is how to ensure that the architecture of value being built today can withstand the tests of tomorrow.

Global trade and finance has changed a lot since the days of early merchant traders such as these fine fellows

ILLUSTRATION: MAURITIUS IMAGES/SKIMAGE/ALAMY STOCK PHOTOS

THE CHANGING FACE OF CASH

From clay tablets to programmable ledgers, a 5,000-year journey into the future of money.

MONEY ISN'T WHAT IT USED TO BE. BUT THEN again, you could say that at any point over the past 5,000 years and it'd be true. The history of money is a history of increasing abstraction – a journey from physical commodities to representational tokens, and finally to pure information.

Five thousand years ago, in the agrarian civilization of Mesopotamia, the earliest money was essentially a ledger system. Clay tokens and bullae – clay envelopes marked with seals –were used to track agricultural debts, commodities and work obligations around 3000 BCE. These tokens represented specific units of value: a jar of oil, a measure of wheat, a day's labor. Value was information, recorded in clay and stored in temples.

A millennium later, medieval England developed the tally stick, a physical innovation that would influence monetary systems for centuries. A split tally stick served as an immutable record of debt. The stick was notched to indicate value, then split lengthwise. One half was kept by the creditor, the other by the debtor. The transaction could only be verified if the two halves matched perfectly, something that those who use the public-key/private-key cryptography that powers Bitcoin today might recognize.

MONEY, MONEY, MONEY

Today, money is undergoing its final abstraction – into code. The distinction is no longer between paper and digital. Most fiat currency is already electronic, existing as entries in commercial bank ledgers. The real distinction is between account-based ledgers, managed by siloed banks, and token-based ledgers that exist on shared, interoperable infrastructure. →

→ This transition brings with it a critical challenge: maintaining the singleness of money. This economic principle holds that a digital pound, dollar or yen issued by Bank A must have the exact same value and usability as a pound, dollar or yen issued by Bank B or the central bank. That's what makes money money. Without it, trust in the system collapses.

But in unregulated crypto environments, stablecoins like USDT or USDC generally trade at par with the dollar, but they carry different counterparty risks and reserve backing. If a major stablecoin "de-pegs," dropping below $1.00, the singleness of money is broken, creating a two-tiered monetary system that undermines trust. Solutions are at hand, though, including a UK initiative called the Regulated Liability Network (RLN).

REGULATED LIABILITY

The RLN project, led by UK Finance and concluded in 2024/2025, brought together 11 major financial institutions including Barclays, Citi and HSBC. The goal was to demonstrate a platform where commercial bank money, tokenized deposits and central bank money can exist on a shared, interoperable ledger while preserving the uniformity of currency.

The trials proved that the UK's legal framework is sufficiently flexible to support such a platform, paving the way for a unified digital financial market infrastructure.

The strategic outcome is significant. Rather than fragmenting into competing private monies, the RLN approach preserves the hierarchical structure of modern central banking while upgrading the technical infrastructure. It's more evolution than revolution.

PROGRAMMABLE CASH

The defining feature of tokenized money is programmability: the ability for money to carry logic and autonomously execute conditional instructions. Smart contracts can embed rules directly into value itself, enabling transactions that were previously impossible or prohibitively expensive.

That's helpful for things like marketplace fraud. Buyers fear paying for goods that never arrive; sellers fear shipping goods without guaranteed payment. The RLN trials demonstrated a programmable payment solution: funds are locked in a smart contract and released only when physical delivery is verified.

The system could also be used in the home-buying process, a complex chain of fund transfers between buyers, sellers, lenders and conveyancers. In traditional finance, this process takes weeks, with each step dependent on the previous one completing successfully. A single failure collapses the entire chain. Programmable money allows for atomic settlement of the entire chain – funds move simultaneously or not at all.

THE FUTURE OF MONEY

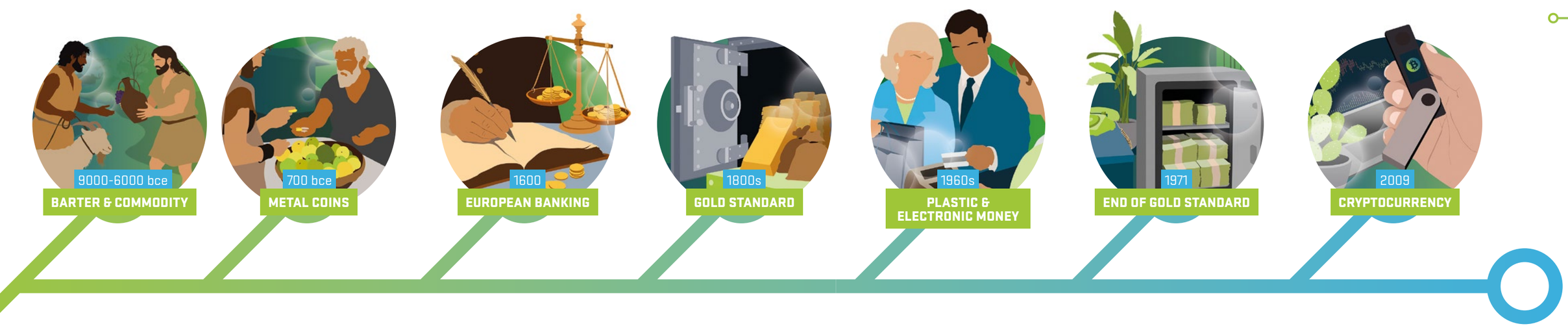
It feels like the transformation from account-based to token-based money is increasingly inevitable. After all, the efficiency gains and the potential for new financial products are simply too compelling to ignore. But the path forward requires careful navigation.

Preserving that singleness of money is essential. Regulatory clarity is necessary. Institutional trust must be maintained. The RLN approach offers one model for how this might be achieved: upgrade the infrastructure without breaking the system. But there are plenty of others, as you'll learn throughout this report.

The clay tablets of Mesopotamia gave way to tally sticks, which gave way to gold, which gave way to paper, which gave way to electronic entries. Each transition brought disruption, but also progress. Today, as money becomes code, the face of money is changing once again – and with it, all the possibilities for human exchange.

PHOTO: FILADENDRON/E+/GETTY IMAGES; ILLUSTRATIONS: CARINA DYLUS

Digital and physical intertwine in ways when it comes to finance - including most obviously in security



$300 b worth of stablecoins in circulation in 2025

$33 tr worth of stablecoins in transactions in 2025

STABLECOINS AND BEYOND

Helping businesses embrace the internet financial system is a key goal of Circle, says Dante Disparte, Chief Strategy Officer and Head of Global Policy & Operations, Circle.

PHOTO: THOMAS WINZ/THE IMAGE BANK RF/GETTY IMAGES

AS WE MOVE THROUGH 2026, the global financial landscape is reaching a definitive inflection point. The conversation around stablecoins has shifted from speculative curiosity to core corporate strategy. This transition is not the result of a single breakthrough, but rather the convergence of regulatory clarity, technological maturity and a growing institutional demand for a more efficient way to move value.

THE GLOBAL REGULATORY FOUNDATION

The primary catalyst for this is the arrival of legal certainty. In the United States, the GENIUS Act has established the first comprehensive federal standards for stablecoin issuers, providing the "rules of the road" that institutional actors have long awaited.

This legislative framework does not exist in isolation. It serves as a vital counterpart to the European Union's MiCA regulations and similar robust regimes in key emerging and developed markets around the world. Although there is still work to do on this front, we are seeing a historic harmonization of global rules that enables businesses and institutions to accelerate and deploy stablecoin strategies across borders. For the modern enterprise, this regulation provides something more valuable than any tech feature: predictability.

Importantly, this regulatory clarity ensures that issuers race to the top. GENIUS, MiCA and other regimes raise the bar on reserve quality, redemption rights, governance, financial-crime controls and other prerequisites for enterprise participation. The key for business leaders is choosing partners that can meet those obligations consistently across jurisdictions.

DIGITAL CASH AS FINANCIAL SHAREWARE

Why are so many markets taking the time to get these regulations right? And why are so many of the world's largest businesses already building with stablecoins? It is because of their truly transformative potential. Stablecoins represent the financial equivalent of Artificial Intelligence. While every business in the world is racing to unleash the benefits of AI across their tech platforms, stablecoins can do the same for the financial systems.

With almost $300 billion in circulation and some $33 trillion in transactions in 2025, stablecoins are proving they can handle the scale and speed required by global commerce. They supercharge how money moves across borders using the open internet the same way every other form of data has been moving for years. They also introduce programmability, which is simply not possible in traditional payments. This allows enterprises to automate financial operations end-to-end. Capabilities like fully automated invoice reconciliation can become practical. In global trade, stablecoins can enable breakthroughs like digital escrow accounts, where →

→ both importers and exporters can monitor flows of goods and money in real time, and where payments can be automatically programmed for release upon shipment receipt.

And with more financial market activity moving to 24/7, stablecoins can offer risk mitigation and capital efficiency benefits to institutions and trading venues, with collateral mobility and settlement no longer bound by banking hours and legacy systems.

Critically, as with AI, it is not necessary for businesses to build their own stablecoin infrastructure from scratch. Scaling a stablecoin is an immense undertaking that requires time, significant upfront investment in specialized operations and compliance infrastructure, and the ability to overcome cold-start problems that have hampered many stablecoin launches in recent years. Partnering with an established issuer that has already built this infrastructure and scaled a stablecoin is the faster, more certain path.

THE START OF AN EVEN BIGGER PLATFORM SHIFT

We are entering the earliest stages of a broader platform shift in which we see more economic activity moving onchain. This shift marks the rise of what we have described in our report Beyond Stablecoins: The Rise of the Internet Financial System: an always-on, programmable financial layer that operates with the global reach and resilience of the internet itself.

“ Unlocking the benefits of this system for mainstream commercial activity requires new categories of financial infrastructure.”

Unlocking the benefits of this system for mainstream commercial activity requires new categories of financial infrastructure. Just as the internet needed operating systems and networks to coordinate information at scale, the internet financial system requires foundational layers for economic coordination, trust and settlement. At Circle, we describe this as an “economic OS for the internet,” embodied in infrastructure such as Arc, a purpose-built Layer 1 designed for institutional-grade economic coordination.

Upon this foundational layer, regulated stablecoins and new apps help to form a shared, always-on settlement fabric that links banks, payment service providers and enterprises. Together, these components enable 24/7 value movement, improved capital efficiency and financial coordination globally.

Taken together, this represents the most consequential evolution in global finance in decades. Early adopters are already engaging with this new financial layer as a strategic foundation for how value will move across the global economy.

PHOTO: THANA PRASONGSIN/MOMENT RF/GETTY IMAGES, CIRCLE

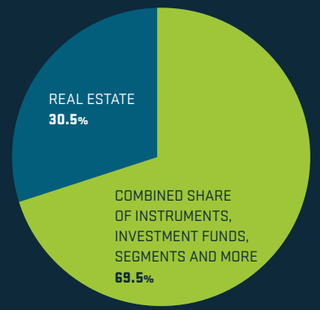
DANTE DISPARTE

is Chief Strategy Officer and Head of Global Policy & Operations, Circle. Dante leads global growth and regulatory strategy, public policy, market expansion, international operations and communications. He is a key strategic leader building our business, forging government relations and taking us into new markets. He brings decades of experience working in complex global financial and risk issues and most recently served as a founder of the Diem Association.

TOKENIZED ASSETS ON THE RISE

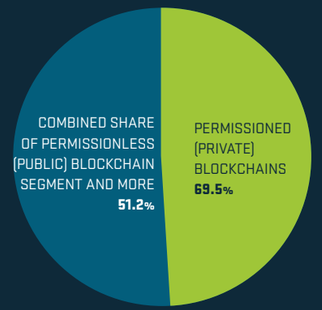
A growing market has plenty of space still to grow, the data show.

ASSETS TOKENIZATION MARKET: MARKET SIZE BY ASSET CLASS, 2024



SOURCE: MORDOR INTELLIGENCE, 2025

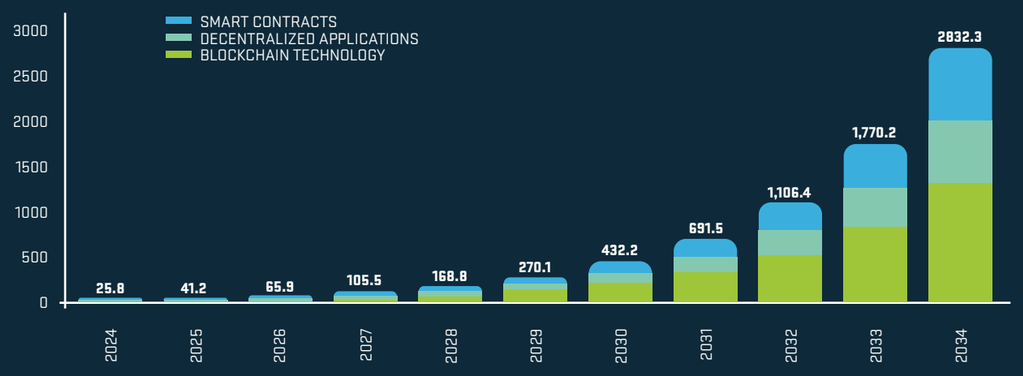
ASSETS TOKENIZATION MARKET: MARKET SIZE BY PLATFORM TYPE, 2024



SOURCE: MORDOR INTELLIGENCE, 2025

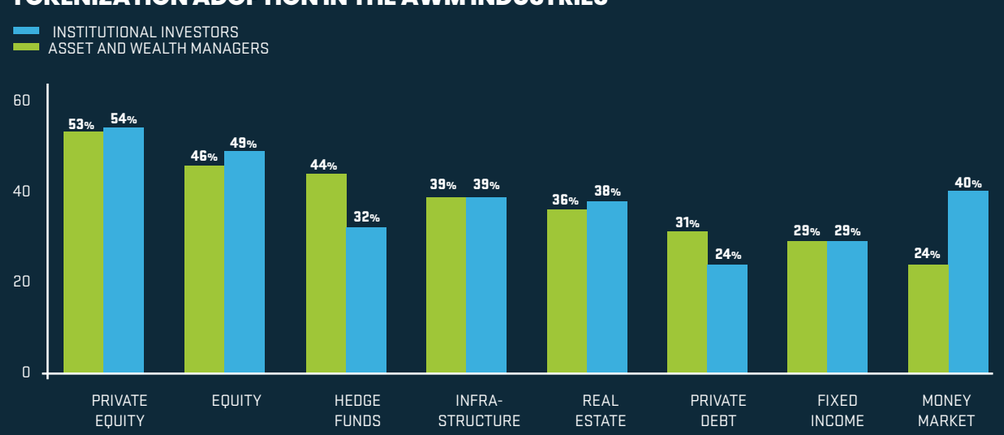
GLOBAL TOKENIZED ASSETS MARKET

Size, By Component, 2025-2034 (USD Billion)



SOURCE: MARKET.US

TOKENIZATION ADOPTION IN THE AWM INDUSTRIES



SOURCE: ELECTROIQ 2025

INDUSTRY OUTLOOK: BASE ESTIMATE OF POTENTIAL VALUE OF TOKENIZED ASSETS BY 2030 IS NEARLY $2 TRILLION

An analysis of tokenization waves by asset capitalization potential and adoption drivers

WAVE	2030 TOKENIZED ASSET MARKET CAPITALIZATION BASE CASE	$ TRILLION	EXAMPLES OF USE CASES DRIVING ADOPTION
1	CASH AND DEPOSITS[1] (EXCLUDED FROM TOTAL)	-1.1	24/7 BUSINESS-TO-BUSINESS PAYMENTS
	MUTUAL FUNDS AND ETFS[2]	-0.4	MONEY MARKET FUND DISTRIBUTION
	LOANS AND SECURITIZALTION[3]	-0.3	STREAMLINED WAREHOUSE LENDING
	BONDS AND EXCHANGE-TRADED NOTES[4]	~0.3	INTRADAY REPO/COLLATERAL MOBILITY
2	ALTERNATIVE FUNDS[5]	-0.2	DISTRIBUTION AND INVESTOR ONBOARDING
	ALTERNATIVE ASSETS[6]	-0.1	LIQUID SECONDARY MARKET
	UNLISTED EQUITIES[7]	-0.1	LIQUID PRIVATE MARKETS FOR SECONDARY SALES
	PRECIOUS METALS[8]	~0.1	COLLATERAL IN DECENTRALIZED FINANCE
3	PUBLICLY LISTED EQUITIES[9]	<0.1	CLEARING AND SETTLEMENT EFFICIENCIES
	INTANGIBLE ASSETS[10]	<0.1	REAL-TIME DISTRIBUTION OF ROYALTIES
	DERIVATIVES[11]	<0.1	CLEARING AND SETTLEMENT EFFICIENCIES
	TOTAL VALUE TOKENIZED IN 2030	-1.9	

1 Tokenized cash and deposits are excluded from total to avoid double counting, since these are involved in the settlements of trades involving tokenized assets. 2 ETFs, mutual funds and money market funds. 3 Wholesale loans, mortgage and home equity, structured credit. 4 Government bonds, municipal bonds, corporate bonds, commercial paper, etc. 5 Private equity/venture capital funds. 6 Real estate (including real estate investment trusts), carbon, art and collectibles, and commodities (excluding precious metals). 7 Single unlisted private equity and mezzanine financing. 8 Gold, silver, platinum, palladium. 9 Listed corporate equities. 10 Intellectual property (brands, trademarks). 11 Options, futures, swaps, warrants, investment certificates, excluding over-the-counter derivatives.

SOURCE: MCKINSEY 2025

PHOTO: BUSAKORN PONGPARNIT/MOMENT RF/GETTY IMAGES

POWERING THE CHANGE

The world of tokenized assets may appear ethereal, existing as code on distributed ledgers. But its foundation is intensely physical. They require energy, computation, hardware and massive infrastructure. So how is the physical infrastructure of digital assets being repurposed, reimagined and re-engineered to serve both the needs of blockchain networks and the broader computational demands of the digital economy?

THE PHYSICAL BACKBONE OF DIGITAL INFRASTRUCTURE

How the convergence of Bitcoin mining and AI compute is redefining energy, grid stability, and the future of data centers.

CONJURE UP DIGITAL ASSETS IN YOUR MIND'S eye and you're likely thinking about intangible code that's weightless, borderless and existing somewhere in the cloud. But behind that, their creation and maintenance are absolutely rooted in the physical. The blockchain runs on servers. Servers require electricity. And electricity generation is an industrial activity that relies on physical infrastructure.

Bitcoin mining and artificial intelligence (AI) have brought that to mind clearer than usual. Both require massive amounts of power, but in fundamentally different ways. AI data centers require continuous, high-reliability power to train large language models. By comparison, Bitcoin miners serve as "interruptible load." They can power down instantly to stabilize grids during peak demand.

The result was that by mid-2025, former bitcoin mining firms began retrofitting facilities for AI and high-performance computing workloads. The infrastructure built for crypto found new purpose powering the AI revolution.

FROM MINER TO ENERGY PARTNER

MARA Holdings, who we'll hear from later in this report, is one example of this evolution. What began as a Bitcoin mining firm has transformed into a diversified energy and infrastructure provider. As of 2026, MARA operates 18 data centers worldwide, showing quite how significant the need for data centers has become.

But the more interesting story is how MARA interacts with energy systems. In Texas, MARA's facilities in McCamey and Granbury sit behind the meter at wind farms and gas plants. This arrangement means that, when the grid is stressed during extreme weather events or demand spikes, MARA voluntarily powers down, releasing hundreds of megawatts back to the ERCOT grid. The company is consuming energy but can also provide grid flexibility when needed.

In Abu Dhabi, partnered with Zero Two, MARA established the region's first large-scale immersion-cooled data centers. Immersion cooling submerges server components in dielectric fluid, dramatically improving thermal efficiency compared to traditional air cooling. The technology reduces both energy consumption and water usage, something that is a critical consideration in the hot and arid Gulf region.

HEATING WITH HASHES

But it's not just in hot places that MARA and other data centers need to operate. Perhaps the most creative application of Bitcoin mining's physical output is occurring in the Satakunta region of Finland, where MARA launched a 2-megawatt pilot project that captures waste heat from ASIC mining rigs and feeds it into a district heating network.

That works because Bitcoin miners generate heat as a by-product of computation. And in a data center, heat must be removed to keep equipment from overheating. Traditionally, that heat is vented into the atmosphere and wasted. But the Finland project captures the heat via heat exchangers and pumps it into underground pipes that distribute warmth to approximately 11,000 residents.

The economics work on both sides: the mining operation reduces its cooling costs by selling the heat rather than paying to eject it. The district heating system gains a carbon-neutral heat source that would otherwise require burning natural gas or biomass. The residents receive warmth at stable prices.

It's a prime example of where the power of creative engineering can help address one of the most persistent criticisms of cryptocurrency: its energy consumption. By repurposing waste heat, the Finland pilot transforms a by-product into a resource, creating value from what was previously considered a cost. →

PHOTO: SANDERSTOCK/GETTY IMAGES/ISTOCKPHOTO

945 TWh
global data center electricity consumption in 2030

415 TWh
global data center electricity consumption in 2024

(SOURCE: INTERNATIONAL ENERGY AGENCY, ENERGY AND AI REPORT, 2025)

→ AI AND BITCOIN CONVERGE

The convergence of Bitcoin mining and AI compute is a massive trend in digital infrastructure. Both industries face the same fundamental challenge: acquiring access to reliable, affordable power at scale. Bitcoin miners spent years building out capacity in locations with excess energy. AI companies need that same capacity today.

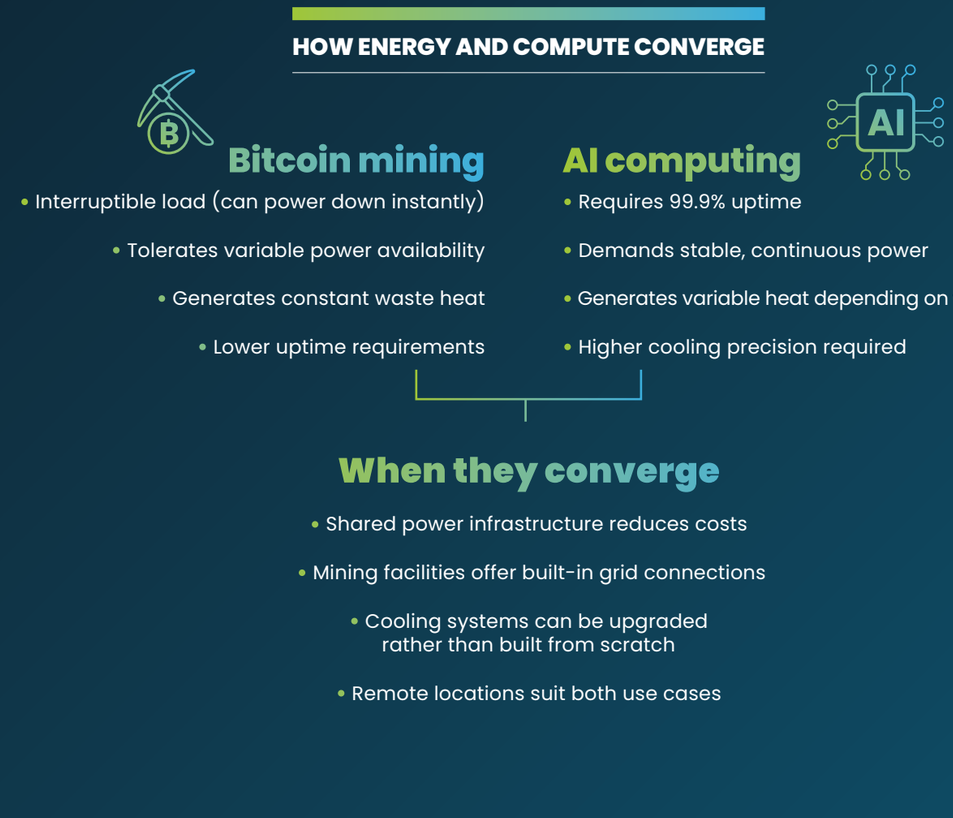
So there has been a rapid repurposing of mining facilities. Bitcoin mines are uniquely suited to AI conversion because they already have the power infrastructure, the cooling systems and the remoteness required for large-scale compute operations. The conversion process involves replacing mining ASICs with GPU clusters and upgrading cooling systems to meet AI's more stringent temperature requirements.

But such a convergence has implications for energy grids worldwide. Bitcoin miners have been praised for their ability to act as controllable load, powering down during grid stress events. AI data centers typically require 99.9% uptime and cannot interrupt their workloads. As miners convert to AI, the grid loses some of that flexibility – and demand is continuing to rise and rise.

One thing is abundantly clear: the demand for compute power will only increase. The International Energy Agency estimates global data center electricity consumption will more than double to around 945 TWh in 2030, versus roughly 415 TWh in 2024, with data centers driving over 20% of global power demand growth through the period. McKinsey puts data center power demand even higher in a more aggressive scenario, at roughly 1,400 TWh by 2030. AI model training requires exponentially more computation with each generation. Blockchain networks continue to scale. The physical infrastructure supporting both must grow in parallel.

When thinking about something as important as data centers, the physical backbone of digital infrastructure is becoming increasingly strategic. Nations with abundant energy resources – the United States, the Gulf states, the Nordic countries – are positioning themselves as hubs for both crypto and AI compute. The companies that control this infrastructure are diversifying beyond their original mandates.

The transformation from weightless digital assets to physical infrastructure may seem paradoxical. But it's a reminder that even in the digital age, the economy remains rooted in atoms, energy and geography. The cloud is someone else's data center, a data center powered by the physical infrastructure of the real world.



“ AI and Bitcoin share more than infrastructure. Their futures are converging, and the early months of 2026 are already proving it out.”

WHY BITCOIN IS AN ENERGIZING OPPORTUNITY

Fred Thiel, Chairman & CEO, MARA, explains how Bitcoin became an energy business and why AI needs it next.

FRED THIEL

is the Chairman of the Board of Directors and Chief Executive Officer of MARA, Inc. (NASDAQ: MARA) and has over 35 years of experience in the technology sector. Mr. Thiel is an acclaimed innovator and expert, having led organizations across diverse fields including digital assets, AI, semiconductors and enterprise software. Under his leadership, MARA has expanded to 18 data centers across four continents with an energy capacity of over 1,200 MW. He is a frequent commentator on the intersection of energy and technology for CNBC, Bloomberg and FOX Business.

IN LATE 2025, THE BITCOIN network’s hashrate crossed 1 Zettahash per second, a combined sextillion computations every second, binding digital currency to physical reality. Before Bitcoin is a monetary network, it is a physical one: specialized computing hardware, housed in data centers around the world, powered by energy. This is the same class of infrastructure now in acute demand for artificial intelligence. And the energy that powers it, so often framed as a cost, is actually the feature.

HOW MINING PUTS ENERGY TO WORK

Energy systems around the world produce excess, generate power with no path to market and struggle to balance supply and demand. Bitcoin mining can help address all three.

Curtailed renewables: The International Energy Agency estimates that up to 15% of renewable output could be lost to factors like curtailment by 2030, equivalent to the variable renewable generation of China and Europe combined in 2023. Colocating Bitcoin mining with generation can help recapture that value. Peer-reviewed research published in Heliyon found that adding mining to a solar farm nearly eliminates curtailment losses, cutting the farm’s payback period from over eight years to roughly three and a half. MARA is already applying this principle at our sites across the globe, including at our own wind farm in Texas.

Stranded gas: An estimated 151 billion cubic meters of natural gas was flared globally in 2024, releasing roughly 389 million metric tons of CO_2 equivalent (CO_2e). MARA’s NGON partnership helps redirect some of this stranded gas to power mining operations. Since initial energization in September 2024, the program has avoided approximately 263,652 metric tons of CO_2e emissions as of January 2026, equivalent to removing roughly 61,500 gas-powered vehicles from the road for a year.

Grid balancing: Supply and demand rarely balance perfectly, and most traditional loads can’t power off on command. Bitcoin mining can. When demand spikes, miners power down. When excess floods the system, miners absorb it. During Winter Storm Fern, MARA curtailed 770 MW of demand across three major power markets, helping stabilize grids under extreme stress. →

PHOTOS: MARA

→ In each case, Bitcoin mining converts energy to lasting value, absorbing it when it would otherwise be lost and releasing it when the grid needs it most.

THE OWNERSHIP ADVANTAGE

These outcomes stem from the central role energy plays in mining economics. As the industry's largest operating cost, miners must find low-cost power, which often means stranded, excess and underutilized sources. But securing access to cheap energy may not be enough. We believe the advantage will increasingly favor miners who don't just purchase energy, but own it.

MARA operates approximately 1.8 GW of data center capacity across four continents, with roughly 70% at sites we own and operate. We are also investing directly in energy generation, from our 114 MW wind farm in Texas to on-site gas-to-power operations through NGON. Our collaboration with MPLX takes this further, targeting up to 1.5 GW of natural gas-powered generation and data center capacity that MARA will own.

Miners who own their energy generation unlock a form of optionality unavailable to pure-play operators. They can sell power to the grid when local demand spikes. They can serve AI inference workloads when compute demand surges. And they can mine bitcoin with their remaining available capacity.

Energy ownership doesn't eliminate risk. It creates the flexibility to manage it. And that flexibility strengthens Bitcoin itself: more resilient miners result in a more resilient network.

THE FINANCIAL RAILS FOR AI AUTONOMY

AI and Bitcoin share more than infrastructure. Their futures are converging, and the early months of 2026 are already proving it out.

AI agents, autonomous software systems that plan and execute tasks with minimal human oversight, are maturing rapidly. But today's payment infrastructure was built for humans: credit cards, bank accounts, IDs. Agents have none of these. As Coinbase noted in launching its Agentic Wallets, agents "hit a wall when they need to actually do something that requires money."

In February 2026, three major moves signaled that this problem is being solved. Lightning Labs released an open-source toolkit giving AI agents native access to the Bitcoin Lightning Network, enabling autonomous micropayments. Coinbase launched wallet infrastructure built for autonomous agents, with 50 million transactions already processed on its payment protocol. And Stripe began previewing machine payments, enabling developers to directly charge AI agents. Its product manager noted: "There are billions of us, but we expect trillions of agents."

These are core financial and Bitcoin infrastructure companies, building payment rails for autonomous software, simultaneously and independently. Digital assets like Bitcoin offer what these systems require: programmable transactions, sub-second settlement, and 24/7 global availability. What emerges may be the first financial system built for software, not people.

BITCOIN IS BUILT ON ENERGY. AI MIGHT BUILD ON BITCOIN

Bitcoin is a monetary network. The infrastructure that secures it is becoming an energy network. And Bitcoin itself may soon become the settlement layer for autonomous systems. How these three forces develop over the next decade may reshape energy, finance, and digital infrastructure alike.

PHOTOS: MARA

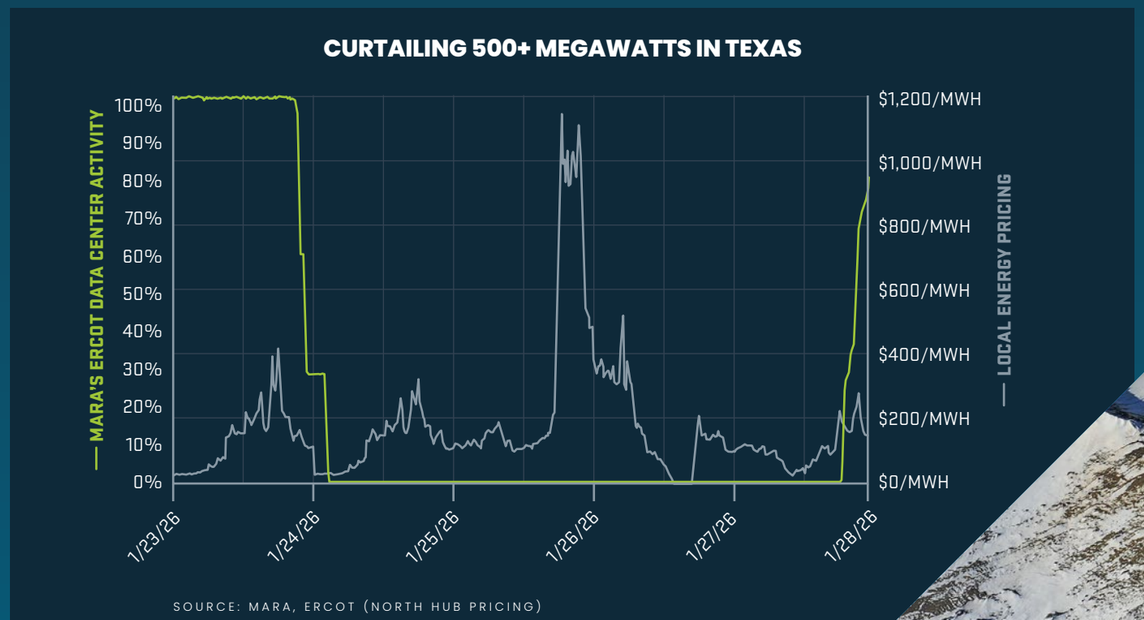


PHOTO: BENSON IBEABUCHI/BLOOMBERG VIA GETTY IMAGES

IMPROVING INCLUSION AND ACCESS

Across the Global South, billions of people lack access to basic financial services. Small businesses cannot obtain credit. Families pay exorbitant fees to send money home. Savings sit idle, unable to earn returns or build wealth over time. Traditional financial systems have failed to bridge these gaps. The infrastructure requirements, the regulatory complexities and the cost structures of legacy banking make serving low-income populations economically unviable under current models. Digital assets can help.

WIDENING ACCESS TO FINANCE

How digital assets and tokenization are bridging the global finance gap.

DO YOU KNOW HOW MUCH IT SENDS TO COST $200 to friends, family or a business around the world? The global average cost of sending $200 was 6.49% in the first quarter of 2025, according to the World Bank. In Sub-Saharan Africa, costs often exceed 8%. For a migrant worker sending money home to family, these fees represent a significant portion of hard-earned income. It could be seen as a tax on the simple act of caring for loved ones across borders.

Remittance friction is just one manifestation of a broader problem: financial exclusion. Across Africa, micro, small and medium enterprises face an estimated $330 billion financing gap. These businesses cannot access the credit they need to grow, hire and serve their communities. Traditional banks, constrained by legacy infrastructure and risk models, often cannot or will not serve them.

Digital finance offers an alternative. Stablecoins on blockchain rails offer settlement at a fraction of traditional costs (often less than 1%) and near-instant speed. Tokenized money markets can connect global liquidity with local borrowers. The infrastructure of value is being reconfigured, and the benefits are flowing to those who need them most.

THE IMPERATIVE OF INCLUSION

Financial exclusion matters because of lost opportunities. A farmer who cannot obtain credit cannot buy fertilizer for the next harvest, a small manufacturer who cannot access working capital cannot fulfill larger orders, or a family without a secure place to save cannot build resilience against economic shocks are all meaningful impacts. But fixing them is tricky.

Traditional finance has struggled to serve these populations for structural reasons. Building physical bank branches in rural areas is expensive. Conducting credit assessments for borrowers without formal financial histories is difficult. Processing small transactions costs nearly as much as processing large ones, making low-value accounts unprofitable.

Digital assets and blockchain technology address these constraints differently. A blockchain is a distributed ledger that exists everywhere and nowhere, with no branches required. Transaction costs are determined by network usage rather than transaction size. Creditworthiness can be assessed using alternative data sources, from mobile phone usage patterns to supply chain relationships.

This is where the power of digital finance can help create pathways to inclusion that were previously impossible. Two case studies illustrate how this is happening in practice.

EMBEDDED FINANCE IN EAST AFRICA

Pezesha, operating in East Africa, has developed a model for embedded finance that bridges the gap between formal capital and informal businesses. The company partners with supply chain aggregators like Twiga Foods, which connects small farmers and vendors to markets.

As farmers and small businesses transact with supply chain aggregators, they generate digital records of purchases, sales and payment history. Pezesha analyzes this data to generate credit scores and offer real-time working capital loans. The entire process can happen on a mobile phone, without the borrower ever visiting a bank branch.

Pezesha has disbursed over $45 million across 377,000 loans. Some 37% of customers are female-led micro, →

Long queues and short opening times can act as barriers to entry to finance in some countries

PHOTO: KANG-CHUN CHENG/BLOOMBERG VIA GETTY IMAGES

→ small and medium enterprises – a demographic that traditionally faces disproportionate barriers to accessing credit. What's more, 28% of borrowers are accessing formal credit for the first time.

The company estimates that its lending has supported over 50,000 jobs. When a small business can access working capital, it can buy more inventory, serve more customers and hire more employees. The multiplier effect ripples through communities.

Pezesha also leverages global blockchain liquidity pools, such as those on the Celo and Cardano networks, to source capital. This creates a direct connection between yield-seeking investors in the Global North and credit-starved merchants in the Global South. The flow of capital is no longer constrained by the correspondent banking relationships that traditional finance relies upon.

MIGRANT-BACKED LENDING

SympliFi addresses a different dimension of financial exclusion: the disconnection between diaspora communities and their families back home. Migrants send over $600 billion in remittances annually, but this money typically arrives as spending on food, rent and bills. It rarely becomes productive capital.

The SympliFi model transforms remittances into lending capital. A migrant living in Europe deposits funds into a SympliFi wallet, which serves as cash collateral for a loan issued by a local bank partner to a relative in Senegal. The migrant earns interest on their deposit. The family member receives a loan to start or expand a business. The local bank gains access to new customers and collateralized lending opportunities.

A United Nations Capital Development Fund-backed pilot in the EU-Senegal corridor processed approximately 2,000 loan requests. The model demonstrates how digital infrastructure can reconfigure financial relationships across borders, turning one-way transfers into two-way economic partnerships.

THE INCLUSION MULTIPLIER

The transformation underway in digital finance is helping make faster settlement and lower costs. But beyond that it's about reconfiguring who has access to the financial system and on what terms.

Tokenization can allow fractional ownership of assets that were previously the exclusive domain of wealthy investors. Stablecoins can dramatically reduce the cost of cross-border transfers. Blockchain-based credit scoring can unlock lending for populations excluded from traditional banking.

But the opportunities ahead won't be reached unless the ecosystem remains focused on inclusion as a core design principle. The ease of launching a token or a DeFi protocol must be matched by safeguards against fraud and predation. The innovation happening in emerging markets must inform the development of global standards.

In the future, the true measure of digital finance's success will not be market capitalization or trading volume. It'll be the number of people who gain access to financial services for the first time, the small businesses that can finally access credit, the families who can send money home without losing a fraction to fees.

6.49% average cost of remitting $200 worldwide (Q1 2025)

8% average cost of remitting $200 in Sub-Saharan Africa (Q1 2025)

<1% stablecoin alternative

PHOTO: MATTHIAS TODT/DPA

THE LIMITS OF TRADITIONAL FINANCE

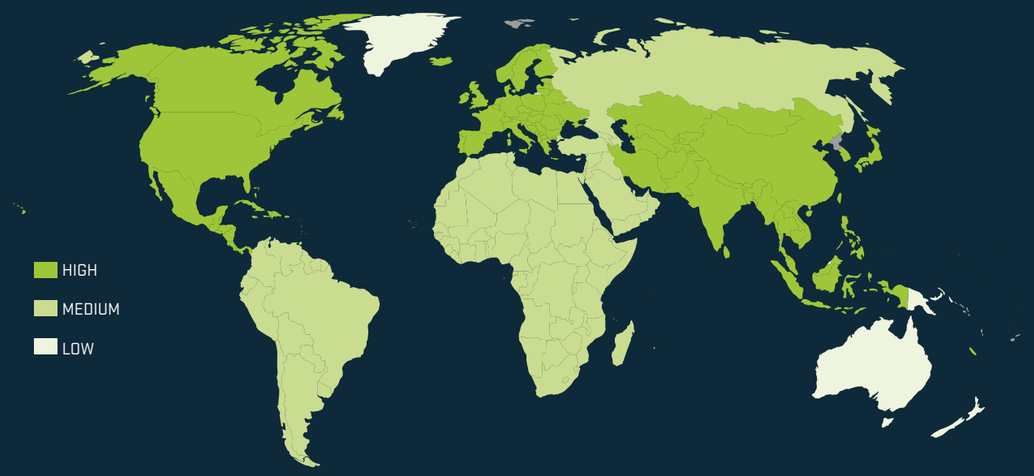
Digital finance and tokenized assets are a world away from the staid old ways of traditional finance.

CONTEXT	TRADITIONAL COST	TOKENIZED / BLOCKCHAIN BENEFIT
Cross-border B2B transfers (€5,000)	0.50% within Western Balkans (WB6); 10× higher than EU intra-transfers (0.05%)	Near-zero to minimal fees on blockchain rails
Cross-border B2B transfers (€20,000)	0.34% WB6 to EU; 17× higher than EU-to-EU (0.02%)	Reduced by eliminating correspondent banks
Currency conversion (FX margins)	1–4% markup over interbank rates, often undisclosed	Transparent on-chain rates; programmable swaps
Trade finance (LC, documentary)	0.1–2% of transaction value + £50–200 amendment fees + £30–150 document processing	Smart contracts automate, no manual review fees
Retail remittances (emerging corridors)	FX margins can be 50%+ of total cost in some corridors	Stablecoin/blockchain rails cut intermediaries

(SOURCE: WORLD BANK, MEASURING THE COST OF CROSS-BORDER BUSINESS-TO-BUSINESS PAYMENTS IN THE WESTERN BALKANS, 2024)

(SOURCE: HOW TRAINING AND ADVICE CAN SPEED CROSS-BORDER PAYMENTS AND CUT COSTS, 2024)

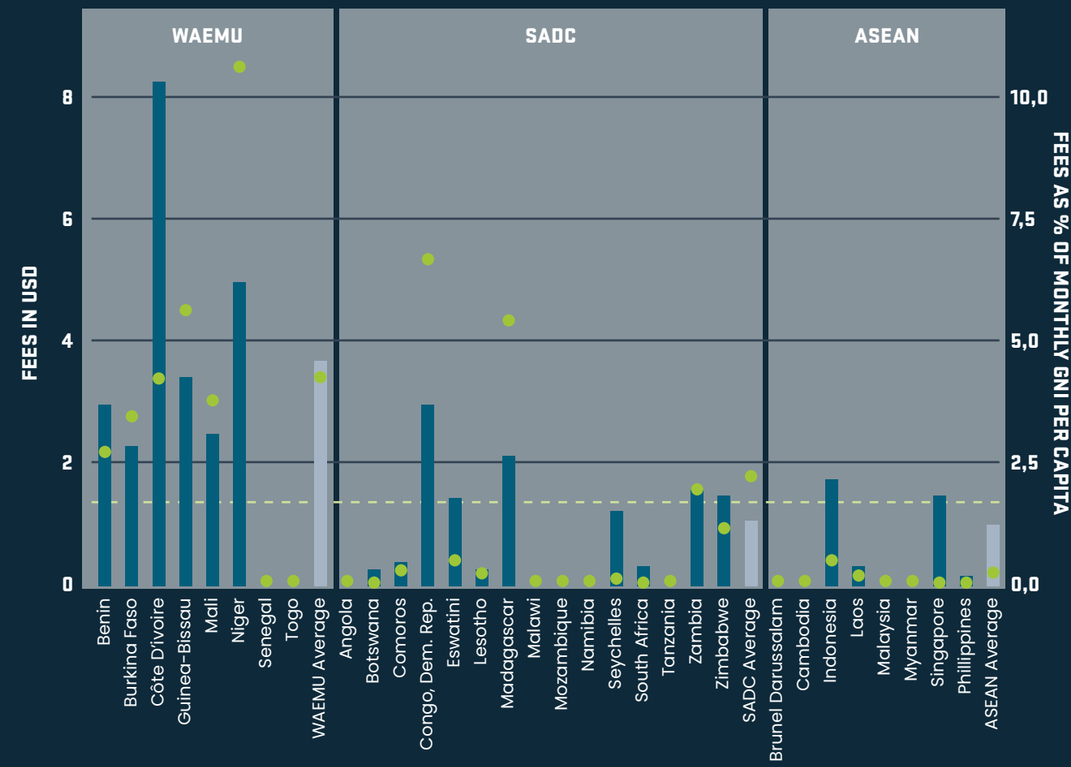
ASSET TOKENIZATION MARKET CAGR (%), GROWTH RATE BY REGION, 2026 - 2031



SOURCE: MORDOR INTELLIGENCE

CHECKING ACCOUNT MONTHLY ACCOUNT FEE (2022)

Low income group



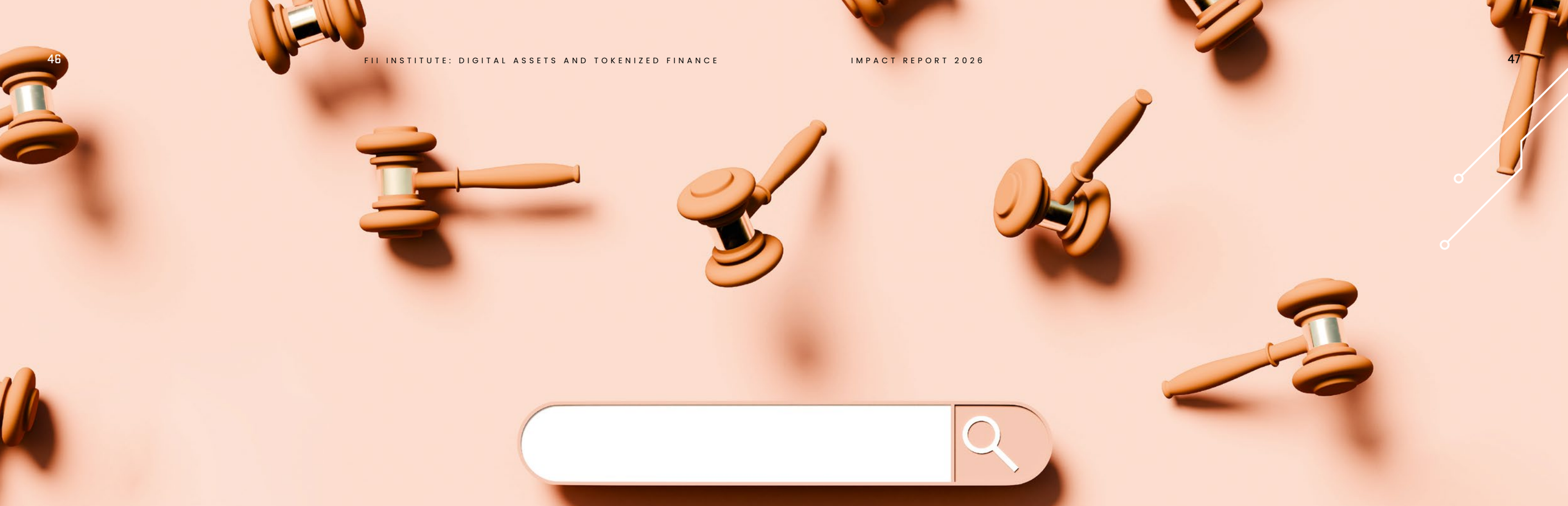
(SOURCE: UNDERSTANDING BARRIERS TO FINANCIAL ACCESS: INSIGHTS FROM BANK PRICING DATA, 2024)

2.5 billion
adults without access to a bank account in 2011

1.4 billion
adults without access to a bank account in 2021

60+ countries that have launched national financial inclusion strategies since 2010

(SOURCE: WORLD BANK, FINANCIAL INCLUSION REPORT)



PENNING PUBLIC POLICY

How the world is writing the rules for the digital asset era.

THE DIGITAL ASSET INDUSTRY HAS ENTERED ITS terrible teens, and regulators are looking on. The wild frontier era, characterized by regulatory uncertainty, jurisdictional arbitrage, and move-fast-and-break-things innovation, is giving way to a more structured environment. Governments worldwide are right now writing the rules that will govern tokenized assets, stablecoins and digital money for decades to come.

The approach, however, is far from uniform. Different regions are adopting fundamentally different frameworks, reflecting distinct values, priorities and economic philosophies. The US has embraced a light-touch approach to stablecoins while rejecting central bank digital currencies. The EU has established comprehensive regulations covering all crypto assets. The UK is pursuing a sandbox model that allows firms to test innovations under regulatory supervision.

These differences matter, because they will shape where companies locate, which markets develop first and how the benefits of digital finance are distributed. A fragmented regulatory landscape could create barriers and inefficiencies. A harmonized approach could accelerate adoption and reduce compliance costs.

It's therefore vital to have thoughtful policy that can help or hinder the development of digital finance. The rules being written today will determine whether tokenization fulfills its promise of broader access and greater efficiency, or whether it becomes another siloed financial system serving only the already privileged.

PHOTO: J STUDIOS/DIGITAL VISION/GETTY IMAGES

THE EU APPROACH

As you'd expect from Europe, there's a belt and braces approach in place. The Markets in Crypto-Assets regulation, known as MiCA, fully entered into force across the European Union in 2025. MiCA represents the most comprehensive attempt to regulate digital assets at scale, creating a unified licensing regime for Crypto-Asset Service Providers across all 27 member states.

Before MiCA, crypto companies operating in Europe faced a patchwork of national regulations. A company licensed in France might need separate licenses to operate in Germany, Italy or Spain. MiCA established a "passport" system, which means a license in one EU country allows operation across the entire bloc. This dramatically reduced compliance costs and created a market of 450 million consumers with a single set of rules.

Industry observers describe a "flight to quality" as unregulated or lightly regulated projects seek MiCA compliance to access the European market. The clarity provided by comprehensive regulation has attracted institutional participants who were previously reluctant to engage with digital assets.

MiCA covers stablecoins, tokenized securities, exchange platforms, custodians and issuers. It establishes reserve requirements, disclosure obligations and consumer protections. The European approach is clear: digital assets are legitimate financial instruments and they will be regulated as such.

THE US APPROACH

The United States has taken a different path, shaped by ideological concerns about privacy and monetary sovereignty. In 2025, Congress passed the Guiding and Establishing National Innovation for US Stablecoins Act, known as the GENIUS Act. The legislation mandates →

→ that payment stablecoins must be 100% backed by high-quality liquid assets, providing certainty for users and issuers alike.

But the same Congress that embraced stablecoins explicitly rejected central bank digital currencies. The Anti-CBDC Surveillance State Act prohibits the Federal Reserve from issuing a retail digital dollar directly to individuals. The argument is framed in terms of civil liberties: a government-controlled digital currency could enable unprecedented financial surveillance.

The US approach reflects a specific ideological vision. Private innovation, not government action, should drive the development of digital money. Stablecoins issued by regulated companies, rather than a Fed-issued CBDC, represent the future. This contrasts sharply with the European and Chinese views, which see CBDCs as essential for monetary sovereignty.

THE UK APPROACH

The United Kingdom has pursued a middle path through its Digital Securities Sandbox. Rather than establishing comprehensive regulations upfront, the DSS allows firms to test distributed ledger technology-based financial market infrastructures under regulatory supervision.

The approach is iterative. Companies can experiment with tokenized securities, shared ledgers and programmable payments while regulators observe, learn and adjust rules based on real-world evidence. The UK is also prioritizing the upgrade of wholesale infrastructure rather than rushing into a retail CBDC.

This reflects a pragmatic recognition that the technology is evolving faster than rulemaking can keep up. By allowing experimentation under supervision, the UK aims to foster innovation while managing risk.

CBDCS VERSUS STABLECOINS

Beneath the surface of these different regulatory approaches, there's a deeper ideological debate: should digital money be issued by the state or the private sector? Central bank digital currencies represent state issuance of digital money. Stablecoins represent private issuance, typically pegged to government fiat currency.

The European Union and China view CBDCs as essential. They fear that private stablecoins – particularly those issued by US technology companies – could "dollarize" their economies and undermine monetary sovereignty. A European digital euro or Chinese digital yuan ensures that the state retains control over money issuance.

The United States, as you might expect, takes the opposite view. The dollar is already the global reserve currency; the threat of "dollarization" is irrelevant. The concern is not monetary sovereignty but privacy and government overreach. A private stablecoin system preserves the role of banks in money creation and limits the state's ability to monitor financial transactions.

But one thing is abundantly clear: this divide will shape the global financial system for decades. If different regions develop incompatible digital money systems, the result could be a new form of financial fragmentation – precisely the outcome that tokenization was supposed to overcome.

FINDING A HAPPY MEDIUM

The regulatory frameworks being debated today will determine whether digital finance fulfills its promise. Bad regulation could stifle innovation or entrench the power of incumbent players. Good regulation could foster responsible innovation while protecting consumers and preserving financial stability. The challenge now is harmonization. Companies operating globally must navigate multiple regulatory regimes, each with its own licensing requirements, compliance obligations and technical standards. The absence of global standards creates friction and inefficiency.

International organizations like the Financial Stability Board and the Bank for International Settlements are working to coordinate approaches. But national sovereignty concerns limit how far harmonization can go. The result is likely to be a mosaic of approaches, each reflecting local values and priorities.

PHOTO: J STUDIOS/DIGITAL VISION/GETTY IMAGES

A TRIFECTA FOR NAVIGATING DIGITAL ASSETS INNOVATION

Money, matrix and mission are vital to innovating in the world of digital assets, says Ryan Hayward, Head of Digital Assets and Strategic Investments, Barclays.

FOR MORE THAN A DECADE, digital assets have alternately been held up as the future of finance or dismissed as a speculative sideshow. In the last five years, their relevance has accelerated and the conversation has changed – it is no longer dominated by volatility headlines or fringe experiments, but increasingly characterized by serious consideration of the role digital assets can play in the financial system.

The evolution of digital assets into the financial mainstream is illustrated by the rapidly growing market and rising demand from both institutional and retail customers. Tokenization market capitalization is predicted to reach $4-5 trillion by 2030,[1] while 66% of corporates expect to be active in stablecoins by 2026.[2]

As digital assets mature from abstract to utility, we are engaged in understanding the role they can play in meeting the future needs of our customers and clients. To explain the path forward and demystify these complex technologies, I find it helpful to think about what I term the three Ms of digital assets – money, matrix and mission.

When it comes to "money," what form it takes and how it moves is becoming as critical as when it moves. Fundamentally, digital assets offer a new way to store and transfer value. In their native incarnation (e.g. unbacked cryptocurrencies) they were not suitable for mainstream payments, but new forms of digital currency – from stablecoins and CBDCs to tokenized deposits and other tokenized financial instruments – offer potential benefits for the issuer and investor alike. The most immediate advantage is speed, with the ability to settle transactions near-instantaneously across borders, alongside reduced frictions that have traditionally made financial assets costly and slow to trade. The programmability of tokenized deposits may also enable new financial products, tailored services and embedded finance opportunities.

Unlocking the potential of digital money depends on a calculated "matrix": the underpinning framework that enables digital assets to effectively perform their function. The first key component is interoperability, ensuring seamless interaction between existing settlement platforms and emerging digital infrastructures. It is a misapprehension that traditional finance will sit on one side of the ecosystem and digital markets on another. Instead, we must prepare for a future in which digital assets are part of the core financial architecture, not a parallel system. Barclays can play →

"When it comes to 'money,' what form it takes and how it moves is becoming as critical as when it moves."

PHOTOS: MARVIN RECINOS/AFP VIA GETTY IMAGES, BARCLAYS

RYAN HAYWARD

is Head of Digital Assets and Strategic Investments at Barclays. He is based in London and heads up Digital Assets globally and Strategic Investments across Europe and Asia at Barclays. The DA team is responsible for digital asset strategy, governance and the establishment of new asset, money and tokenization initiatives across the bank. The SI team is responsible for originating, executing and portfolio managing all strategic principal equity investments made by Barclays in external companies. Ryan joined Barclays in 2011 as an M&A advisor in the investment bank and moved to the Strategy and Corporate Development team in 2013, where he acted as a principal in originating and executing M&A transactions.

→ an important role in facilitating that connectivity, including working with partners to explore and test the infrastructure capabilities that will be key to institutional adoption. For example, GBTD[3] in the UK aims to facilitate orchestration between respective bank tokenized deposits, while LSEG's[4] recent announcement to build an on-chain settlement capability is an important practical step in bridging traditional and digital capital markets.

Interoperability among jurisdictions, as well as asset classes, will also be key to driving progress in digital assets. While recent waves of domestic digital asset regulation are providing greater clarity for market participants, how well these frameworks align across regions will determine the viability of cross-border digital asset flows. Initiatives like Project Agora[5] (a concept proposed by the Bank of International Settlements) and Fnality[6] are aimed at tackling these exact questions.

Finally, the "mission" of digital assets warrants careful consideration. When the pace of technological change is relentless, innovation can sometimes be adopted for its own sake, without a clear purpose, and end up layered onto existing ways of doing things, driving only incremental value. Although digital assets initially gained popularity in niche areas like crypto-trade settlement, their potential has since extended into a range of real-world use cases involving demonstrable improvements in efficiency compared to legacy systems. To illustrate, a number of Financial Market Infrastructure (FMI) players are now switching focus to tokenization. Understanding the value-add must be the collective starting point for navigating the digital asset landscape.

Being thoughtful about digital assets also means looking at the risks as well as the opportunities, including consumer protection, operational vulnerabilities and financial stability. Institutions need to ensure sufficient controls and guardrails are in place to balance innovation with risks to issuers, investors and consumers.

The digital asset roadmap is still being written, but we are at a critical time in the financial ecosystem that echoes the early days of the internet when largely unseen groundwork laid the path for future transformation. The foundational building blocks to take digital asset innovation from concept to reality - "money," "matrix" and "mission" - are coming together, and we look forward to playing our part in that journey while keeping our customers and clients secure and confident.

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PHOTO: NANDSTOCK/GETTY IMAGES/ISTOCKPHOTO

HOW CAN FII INSTITUTE HELP?

Transforming dialogue into action on the future of finance.

PHOTO: FOTOGRAZIA/MOMENT RF/GETTY IMAGES

THE CHALLENGES AND OPPORTUNITIES EXPLORED in this report – from tokenizing real-world assets to widening financial access in the Global South – are far too complex for any single institution to address alone. The transformation of the global financial system requires collaboration across sectors, borders and traditional boundaries.

FII Institute exists to make this collaboration possible. We are not observers of change; we are catalysts for it. Our identity as a "do tank, not think tank" shapes everything we do. We do not merely convene conversations – we deploy capital, we build communities and we drive action.

One of the ways we do so is through our FII PRIORITY Compass, our tool for understanding what matters most to people around the world. By surveying over 50,000 citizens across 24+ countries, we gain insight into the concerns, priorities and aspirations that shape daily life.

The 2025 findings are clear: inflation and the cost of living remains the number one global concern, cited by 50% of respondents. That's a reflection of kitchen table realities. Families are struggling to afford housing, food, energy and healthcare. Small businesses are grappling with rising costs and uncertain access to capital.

These findings guide our approach to digital finance. The technologies we champion must address these fundamental concerns. Tokenization is not valuable because it is innovative; it is valuable because it can reduce costs and unlock capital. Digital money matters not because it is novel, but because it can make financial services more accessible and affordable.

INVEST WITH PURPOSE

At FII Institute we often speak of "investing with purpose" – the idea that capital should flow to companies and technologies that make a positive difference in people's lives. This vision shapes our summits, our investments and our community-building efforts.

Our FII PRIORITY Summits are catalysts where policy, capital and innovation converge. We bring together heads of state, institutional investors, start-up founders and thought leaders not just to talk, but to forge partnerships that drive action.

When a traditional bank executive meets a digital asset entrepreneur at an FII event, the conversation often leads to collaboration. When a policymaker engages directly with a blockchain developer, regulations become more practical. When an investor hears directly from a founder building financial inclusion tools in the Global South, capital flows to where it is needed most.

CHARTING A PATH FORWARD

Looking ahead, FII Institute's role in the digital finance ecosystem will only grow. We will continue to invest through our ACT pillar in companies that are widening access, reducing costs and building more inclusive financial systems. We will continue to convene the diverse community needed to drive this transformation forward. We will continue to use data from the FII PRIORITY Compass to ensure that our work addresses what matters most to people worldwide.

The architecture of value is being rewritten. The question is whether this new architecture will serve all of humanity or only a privileged few. FII Institute exists to ensure the answer is the former. We are turning dialogue into action, insight into impact and vision into reality.

This is what it means to be a do tank in a world full of think tanks. This is what it means to invest with purpose.

COUNTING UP THE LESSONS LEARNED

What we've learned about the future of digital finance and tokenized assets.

THE DIGITAL FINANCE REVOLUTION HAS ENTERED its industrial phase. The era of "move fast and break things" is being replaced by "move thoughtfully and build infrastructure." The stories in this report reveal a landscape that is rapidly maturing, with real applications, real investments and real impact on real people.

The tokenization tipping point is here

The shift from speculative cryptocurrencies to tokenized real-world assets is underway. Over $8 billion in tokenized US Treasuries, $3.4 billion in tokenized gold and $10 billion in tokenized bonds demonstrate that institutional adoption has arrived. Market projections ranging from $2 trillion to $30 trillion by 2030 may differ on the details, but they agree on one thing: tokenization is transforming how value is held and transferred.

Digital finance's physical reality

For all the talk of intangible digital assets, the infrastructure is intensely physical. Data centers consume electricity at industrial scale. Mining operations generate heat that must be managed. The convergence of Bitcoin mining and AI compute represents a new understanding of how digital infrastructure serves multiple purposes. From MARA's grid stabilization in Texas to heat recycling in Finland, the physical backbone of digital assets is being reimagined.

Inclusion is important

The true promise of digital finance isn't lower costs for large institutions. It's broader access for those who have been excluded. Pezesha's $45 million in loans to East African businesses. SympliFi's migrant-backed lending model connecting Europe and Senegal. The reduction of remittance costs from 6.5% to less than 1%. These are transformative improvements in the lives of real people.

Regulation arriving

The regulatory Wild West is closing. MiCA in Europe. The GENIUS Act in the United States. The Digital Securities Sandbox in the United Kingdom. Different approaches are emerging, reflecting distinct values and priorities. But the direction is clear: digital assets are entering the regulated mainstream. The companies that succeed will be those that embrace compliance and constructive engagement with policymakers.

A foundation of trust

Through all the change, one principle endures: trust is the foundation of finance. The Regulated Liability Network in the UK demonstrates how tokenization can preserve the "singleness of money" while adding programmability. Binance's pivot to compliance-first operations shows even the most disruptive companies must ultimately embrace legitimacy.

The architecture of value is being rewritten

Five thousand years after Mesopotamian clay tablets first recorded debts, we are witnessing another fundamental transformation in how value is conceived and transferred. From account-based ledgers to token-based programmable money. From T+2 settlement to atomic transactions. From siloed systems to interconnected networks.

The question is no longer whether this transformation will happen. It is happening. The question is who will benefit? And whether the new architecture of value will serve all of humanity or only a privileged few.

JOIN THE DEBATE

The future of digital finance and tokenized assets is being written now. The rules are being set, the infrastructure is being built and the early winners are emerging. But the ultimate shape of this transformation remains undecided.
Your perspective matters. Whether you are a policymaker shaping regulation, an institutional investor allocating capital, a start-up founder building the next innovation or simply someone interested in how technology can address human needs, you have a role to play.
FII Institute exists to convene the diverse voices needed to ensure that digital finance serves humanity. Our summits bring together heads of state, industry leaders, investors and entrepreneurs for dialogue that drives action. Our ACT pillar deploys capital to companies aligned with our impact agenda. Our FII PRIORITY Compass provides data on what matters most to people worldwide.
So join the conversation at **https://fii-institute.org**.

Sign up for updates on our upcoming events, read our latest research and learn how you can participate in shaping the future of finance.

CASH IS CHANGING – WHAT WILL IT BECOME?

THE GLOBAL FINANCIAL SYSTEM is undergoing its most profound transformation since the Renaissance, shifting from siloed, analogue systems to programmable, tokenized infrastructure. We've moved beyond speculative crypto into a multi-trillion-dollar revolution grounded in real-world assets like Treasuries and real estate.

This replatforming of value promises instant atomic settlements and 24/7 liquidity. Crucially, it is driving unprecedented financial inclusion. From embedded finance empowering East African entrepreneurs to stablecoins slashing cross-border remittance costs, digital assets are finally democratizing capital access for the Global South.

This digital frontier relies on massive physical infrastructure. As AI and blockchain converge, data centers are ingeniously repurposing energy and waste heat to power this new economy. Meanwhile, global regulators are racing to establish the rules, with the EU, US and UK adopting distinctly different legal frameworks.

Ultimately, the tokenization tipping point is already here. As technology and policy align, this new architecture of value promises to make global finance faster, fairer and far more inclusive.

PHOTOS: ADOBESTOCK, PRIVAT (8)

FII-I has three pillars to deliver its mission: THINK, XCHANGE and ACT

1 FII-I THINK
Identify societal challenges and current inhibitors

Curate the brightest ideas to address societal issues

3 FII-I XCHANGE
Create platforms for live discussions on the future of humanity

Share knowledge, stories and publications with different stakeholders

2 FII-I ACT
Catalyze innovation and initiatives by mobilizing partners and resources

THE FII INSTITUTE IS GUIDED IN ALL IT DOES BY A STRONG PURPOSE, VISION AND MISSION:

PURPOSE
Enabling a brighter future for humanity

VISION
Empowering the world's brightest minds to shape a brighter future for ALL, and with ALL

MISSION
Curating and enabling ideas to impact humanity sustainably

BOARD OF TRUSTEES

SOURCES

Overview of key sources used for this report

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