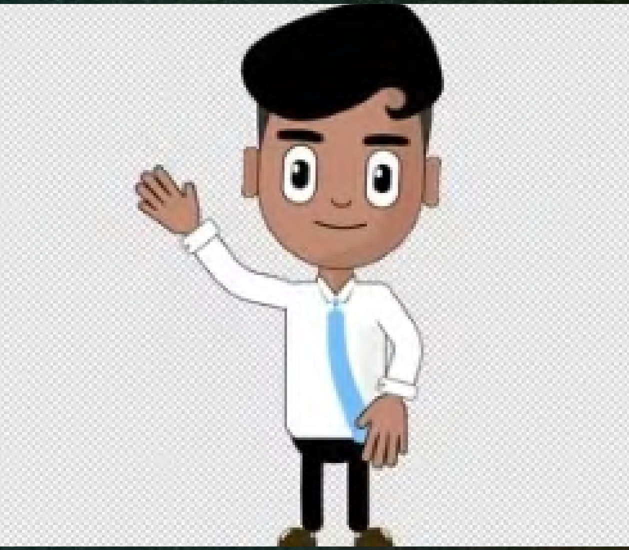
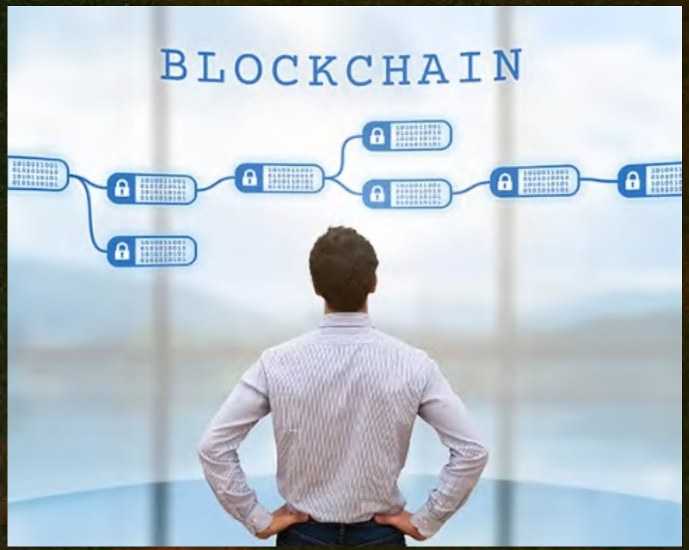
Blockchain Basics

November 12, 2025
Prepared for:
Senate Committee on Commerce & Consumer Protection

Try Pitch





Jacy Youn
Community Operations Lead, Aptos Foundation

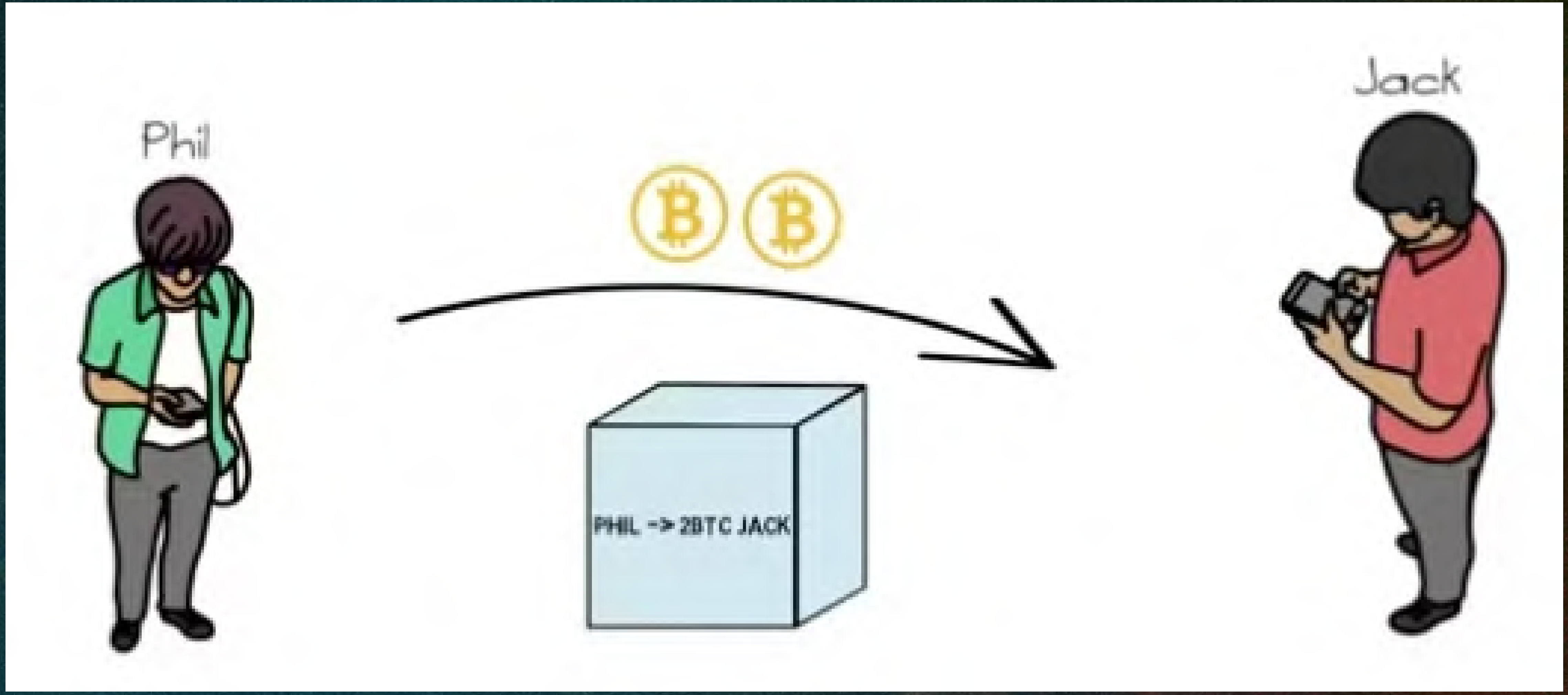
What is the Blockchain & How does it Work?

blockchain: Think 'Digital Ledger'

crypto: Think 'Money on the Ledger'

bitcoin: Think 'OG blockchain'

so how does it work? Validation



Send --> Transaction --> Validation

Two Types of Validations, both involve:

1) Skin in the Game

2) Rewards for your Efforts

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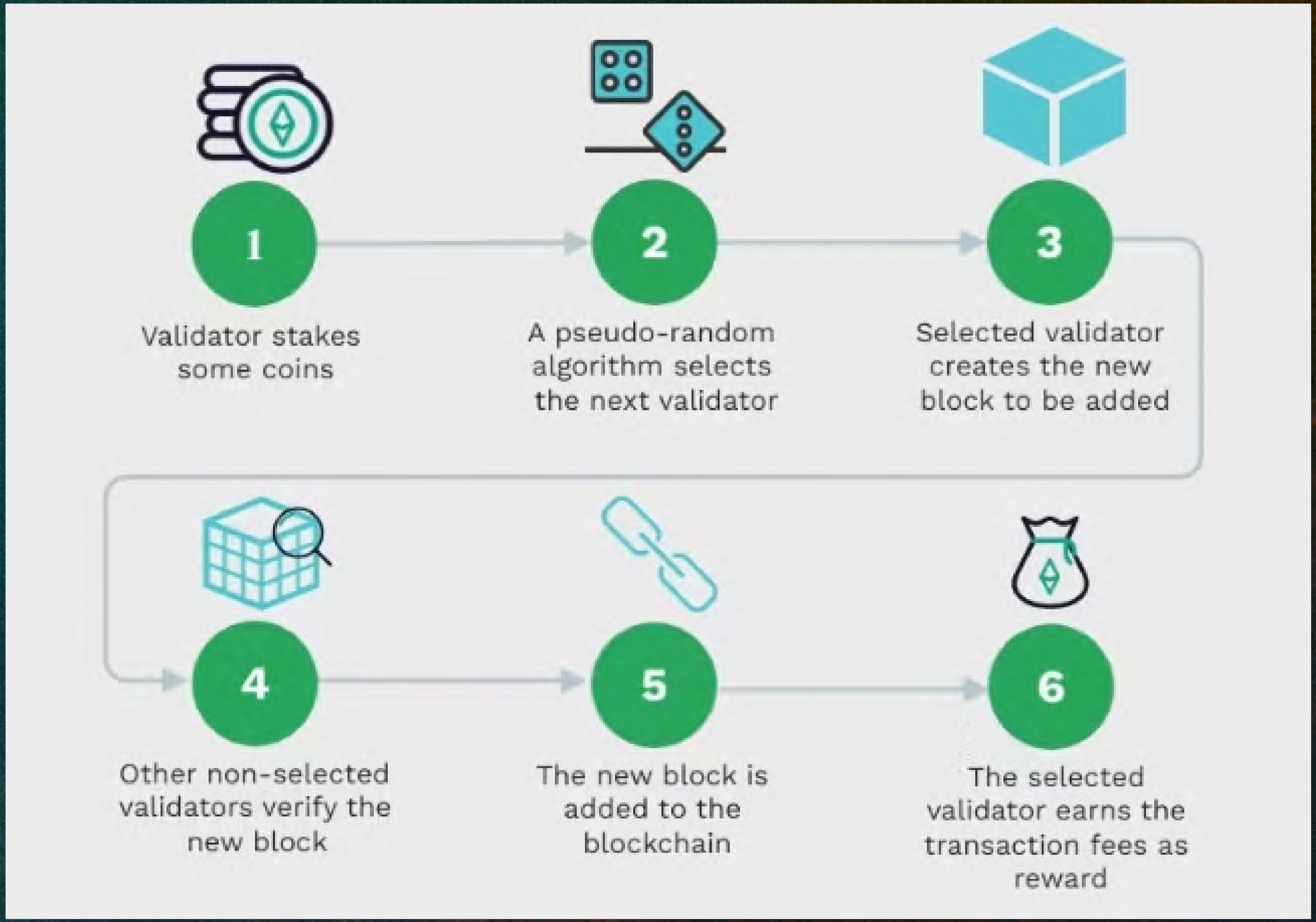
1) Proof of Work

- Mining Transactions by solving complex math puzzles
- 1st to solve the puzzle gets to add the block & earns BTC

- Each block links to the last, making it tamper-proof
- Economic Stake: Computing Power

2) Proof of Stake

- 🚫 Compute Power
- Locking Tokens
- Economic Stake: Investment in the token; post it as a bond
- Faster, Cheaper, Environmentally Friendly
- Payments, RWA, App



Core Tenets of the Blockchain

1) Decentralized	Power not held by one entity; shared across many
2) Secure	Trust built through math, not middlemen
3) Transparent	Faster, cheaper, less chance of corruption or error

What are Smart Contracts?

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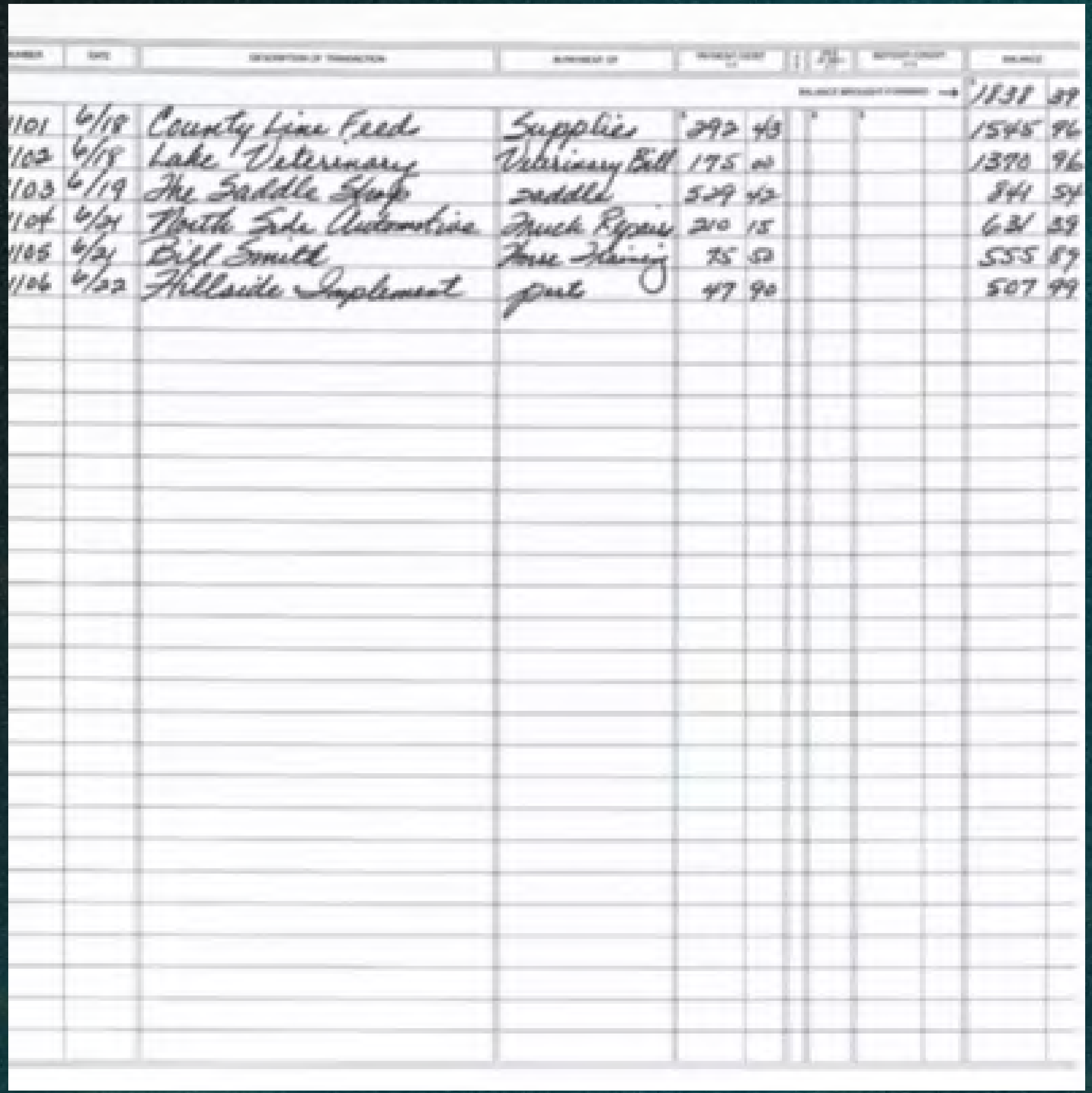
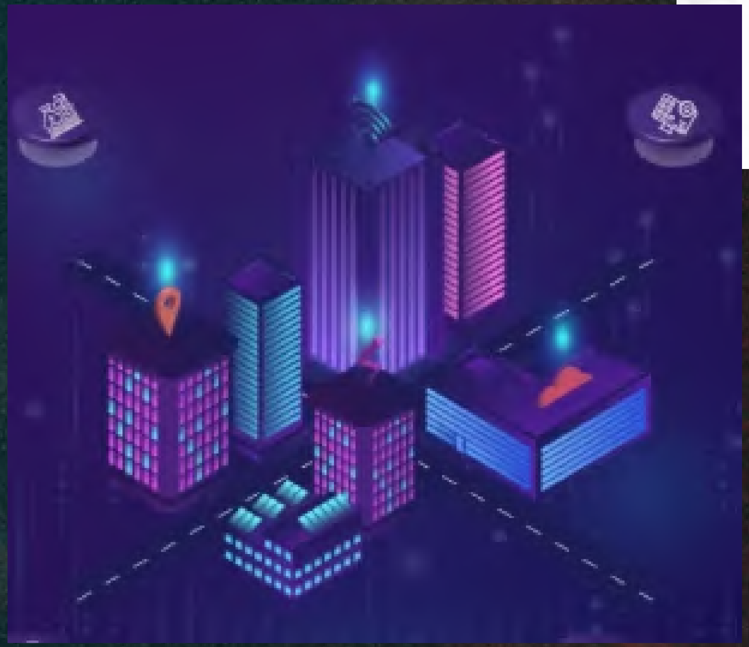
blockchains of yore

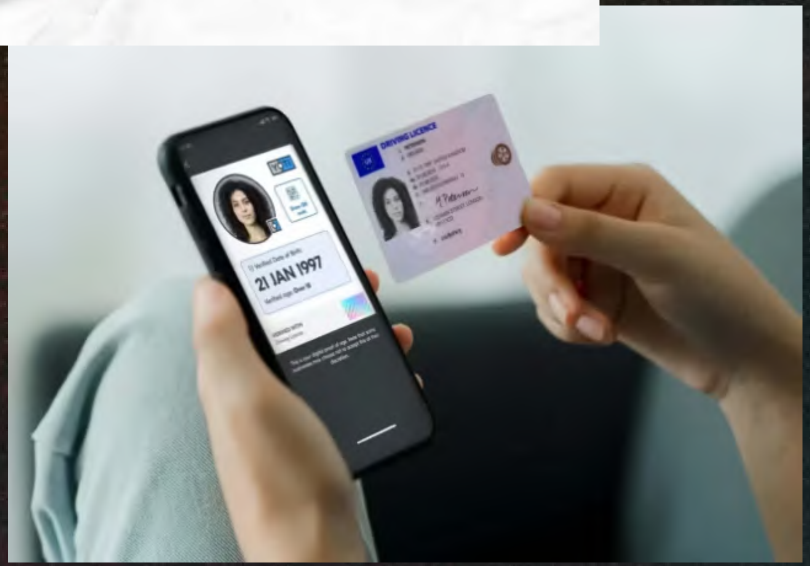


					1838 39
101	6/18	County Line Feed	Supplies	292 43	1545 96
102	6/18	Lake Veterinary	Veterinary Bill	175 00	1370 96
103	6/19	The Saddle Shop	saddle	529 42	841 54
104	6/21	North Side Automotive	Truck Repair	210 15	631 39
105	6/21	Bill Smith	Horse Training	75 50	555 89
106	6/22	Hillside Implement	part	47 90	507 99

smart contract era

Smart Contracts enable:





Real-World Use Cases

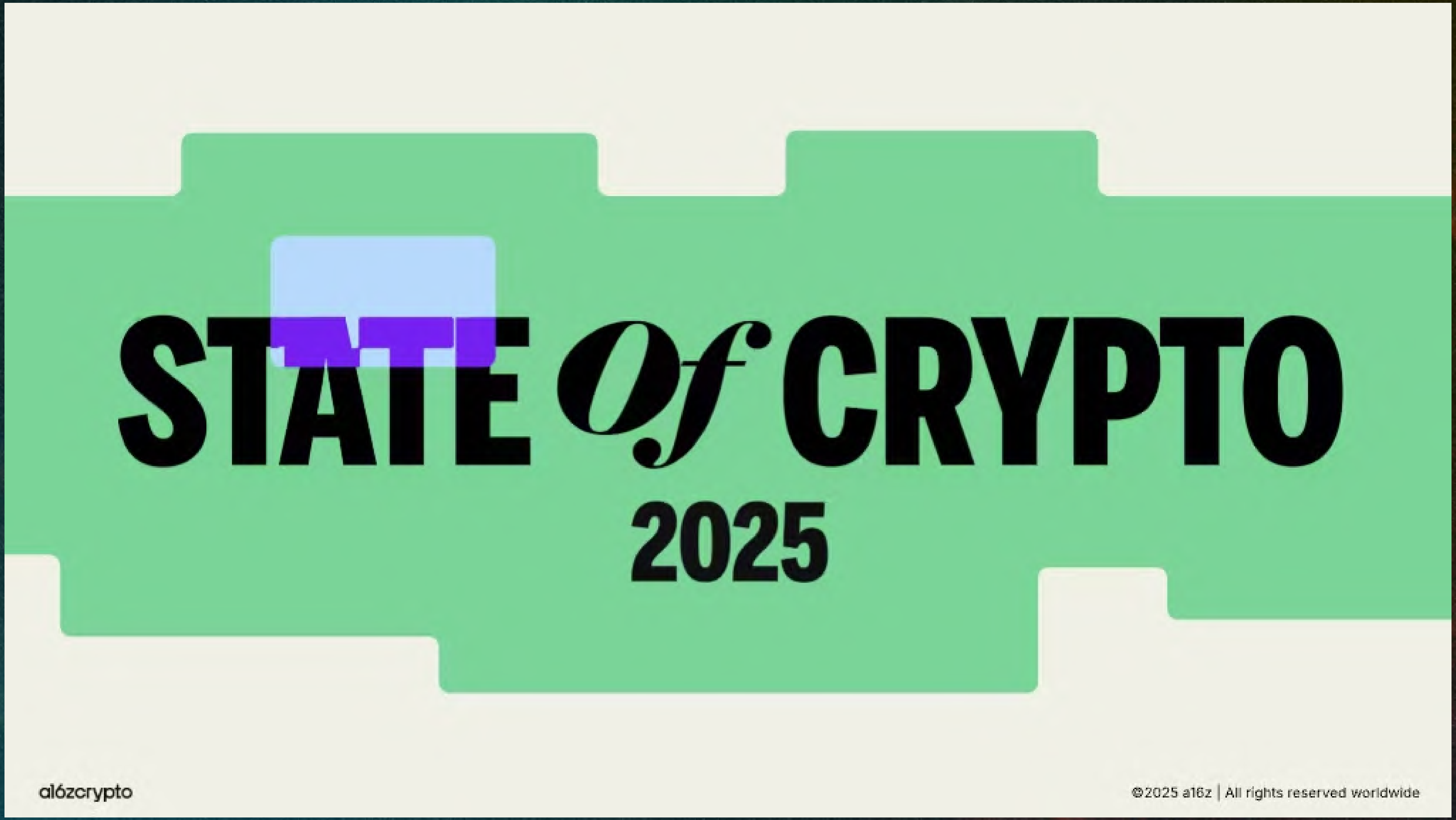
collectibles

car titles

transcripts

Cryptocurrencies, RWA, stablecoins

Fast Facts from a16zcrypto's



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Top Assets by Market Cap

Top Assets by Market Cap

All assets, including public companies, precious metals, cryptocurrencies, ETFs

Rank	Name	Market Cap
1	Gold GOLD	$28.660 T
2	NVIDIA NVDA	$4.846 T
3	Apple AAPL	$3.981 T
4	Microsoft MSFT	$3.760 T
5	Alphabet (Google) GOOG	$3.500 T
6	Silver SILVER	$2.839 T
7	Amazon AMZN	$2.655 T
8	Bitcoin BTC	$2.100 T
9	Broadcom AVGO	$1.692 T
10	Saudi Aramco 2222.SR	$1.685 T
11	Meta Platforms (Facebook) META	$1.592 T
12	TSMC TSM	$1.531 T
13	Tesla TSLA	$1.480 T
14	Berkshire Hathaway BRK-B	$1.072 T
15	Eli Lilly LLY	$866.55 B
16	JPMorgan Chase JPM	$862.65 B
17	Walmart WMT	$816.57 B

Active Owners & Users Increased

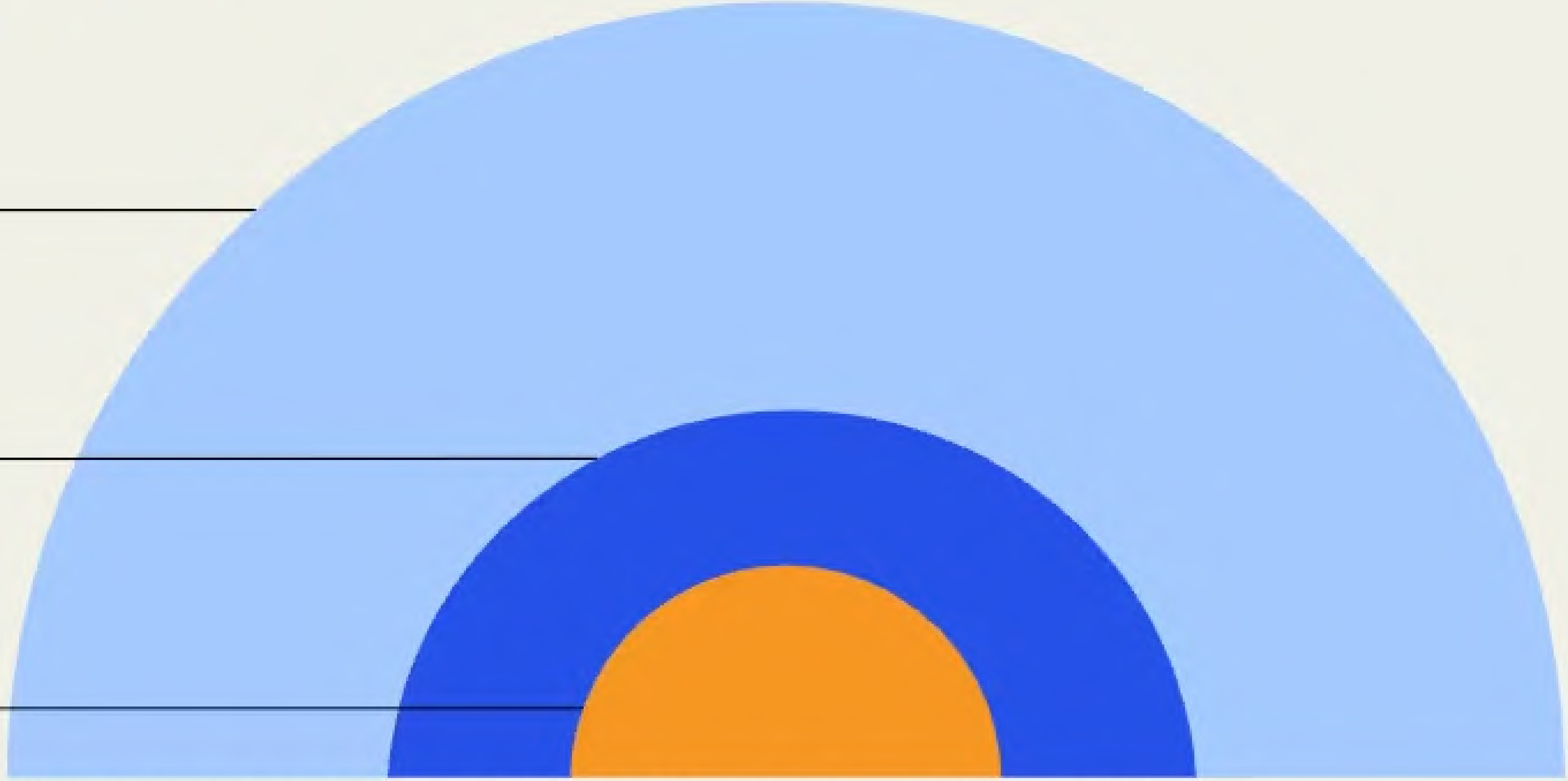
We estimate that the number of monthly active crypto users has grown to 40-70 million

716M
Global crypto owners[1]

181M
Monthly active addresses[2]

40–70M
Estimated monthly active users[3]

~10 million users added in the last year



1/ Represents people who own crypto but do not necessarily transact onchain. Source: Crypto.com as of 8/31/2025
2/ Represents the number of distinct active (sending) addresses across tracked blockchains. Source: Allium as of 9/30/2025
3/ Represents the number of unique people who transact onchain monthly. Source: a16z crypto analysis as of 9/30/2025

the world's largest businesses are onchain

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the world's largest financial institutions are onchain

Some of the largest financial institutions are embracing crypto

CIRCLE

Went public in June 2025, reaching a market cap of more than ***$50 billion***

robinhood

Offered ***tokenized U.S. stocks*** *in the EU; announced its own Arbitrum-based* ***layer 2 blockchain***

BlackRock

Launched BUIDL, its first ***tokenized money-market fund***

Fidelity INVESTMENTS

Rolled out its ***tokenized money-market fund*** *on Ethereum; started testing its own* ***USD-pegged stablecoin***

stripe

Acquired stablecoin platform ***Bridge*** *and wallet infrastructure company* ***Privy****; announced a new payments-focused blockchain called* ***Tempo***

VISA

Launched ***Visa Tokenized Asset Platform*** *and* ***stablecoin-linked cards***

PayPal

Launched "Pay with Crypto" to simplify ***cross-border commerce*** *for merchants*

mastercard

Partnered with Circle to enable ***stablecoin settlement****; created Crypto Credential for* ***secure onchain transfers***

Revolut

Launched Revolut X, a ***standalone crypto mobile app*** *for retail traders across Europe*

shopify

Launched ***support for stablecoins*** *via Shopify Payments and Shop Pay*

J.P.Morgan

Announced a partnership with Coinbase, enabling ***crypto purchases via credit cards***

Morgan Stanley

Announced the offering of ***crypto trading on E*TRADE****, meeting retail demand and pushing crypto further into mass market*

Why this matters for Hawai'i

🧑🧑🧒🧒 Barriers to Opportunity

- High Cost of Living
- Physical Location

🧑🧑🧒🧒 Consumer protection for all: keiki —> kupuna

🧑🧑🧒🧒 Innovation Era

- Start Businesses
- Build Wealth
- Thrive in a Digital Economy

Daily Mail, Tuesday, December 5, 2000

Internet 'may be just a passing fad as millions give up on it'

THE Internet may be only a passing fad for many users, according to a report.

Researchers found that millions were turning their back on the world wide web, frustrated by its limitations and unwilling to pay

By **James Chapman**
Science Correspondent

Woolgar, director of the society, said: 'We are often presented with a picture of burgeoning Internet use, but there is evidence already of drop-off and saturation among users.'

Net loss: Two million Britons have logged off the Internet

Aptos Overview

- High-performance, permissionless, proof-of-stake Layer 1 blockchain designed to support internet-scale applications for billions of users.

- Founded by the team behind Facebook's Libra/Diem project. Aptos's co-founder and CEO, Avery Ching, is born and raised in Hawaii.

- Powering real-world adoption across finance, commerce, and entertainment
  - 3.7 billion transactions with 19 million monthly active users
  - $1.2 billion in real-world assets
  - Sub-second finality
  - Transaction fees ≈ $0.001
  - Over 1,000 developers and hundreds of live projects

Notable Use Cases

- Regulated Finance: BlackRock, Franklin Templeton, Apollo launched tokenized money-market funds on Aptos

- Microlending in Emerging Markets: PACT Protocol is blockchain based platform for lenders with more than $1 billion in on-chain loans

- Decentralized Cloud: Shelby Network (Aptos Labs + Jump Crypto) first decentralized hot storage network and designed for content streaming, AI inference, and real-time apps.

Stablecoins: Future of Payments

- Stablecoins are digital dollars that have become the fastest, cheapest, and most global way to move money.

- $46 trillion in transaction volume last year
  - Double growth versus previous year
  - now 3× Visa and approaching U.S. ACH

- Market cap for USDT (Tether) is $183 billion and for USDC (Circle) is $76 billion, backed by U.S. Treasuries

- Enables 24/7 instant payments at fractional cost. Cross-border remittances settle in seconds vs days through SWIFT/ACH

Road Ahead

- Blockchain will anchor the next generation of financial infrastructure — transparent, interoperable, and built for innovation.

- Global institutions are integrating crypto directly into consumer offerings.

- Hawaii has an opportunity to lead responsibly — balancing consumer protection with innovation.

- Supporting this industry will strengthen economic resilience, attract high-value industries, and foster innovation and inclusion

Crypto in the US Law & Policy 2025

Hermine Wong

November 12, 2025

How many Americans own crypto

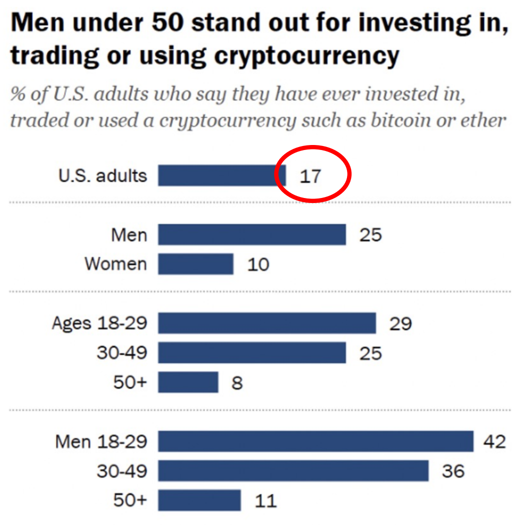
Table 30. Cryptocurrency use
Percent

Type of use	2021	2022	2023	2024
Bought cryptocurrency or held as an investment	11	8	7	7
Used cryptocurrency to buy something or make a payment	2	2	1	2
Used cryptocurrency to send money to friends or family	1	2	1	1
Any use of cryptocurrency	**12**	**10**	**7**	**8**

Note: Among all adults. Respondents could select multiple answers.

Federal Reserve
n=12,295

May 2025



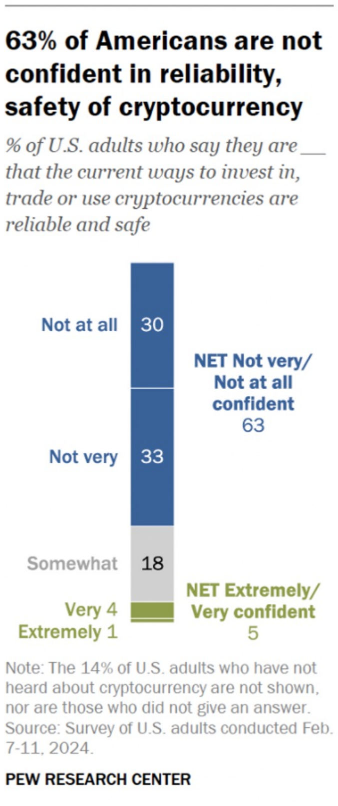
Pew Research Center
n=10,133

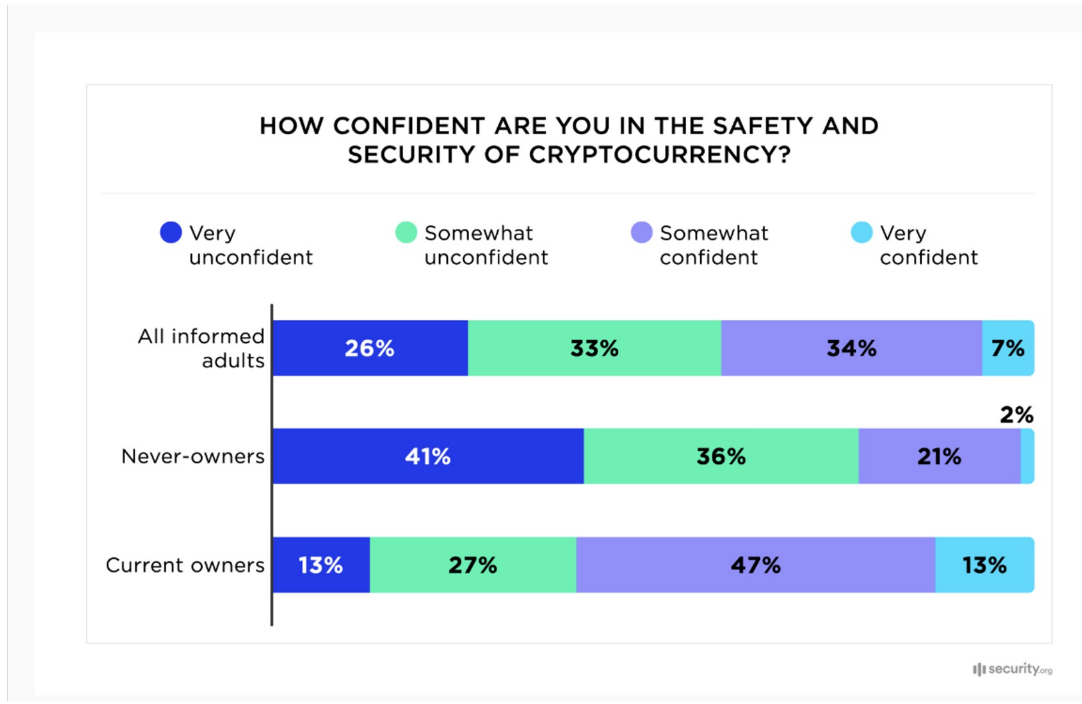
October 2024

National Cryptocurrency Association
n=10,000 crypto holders

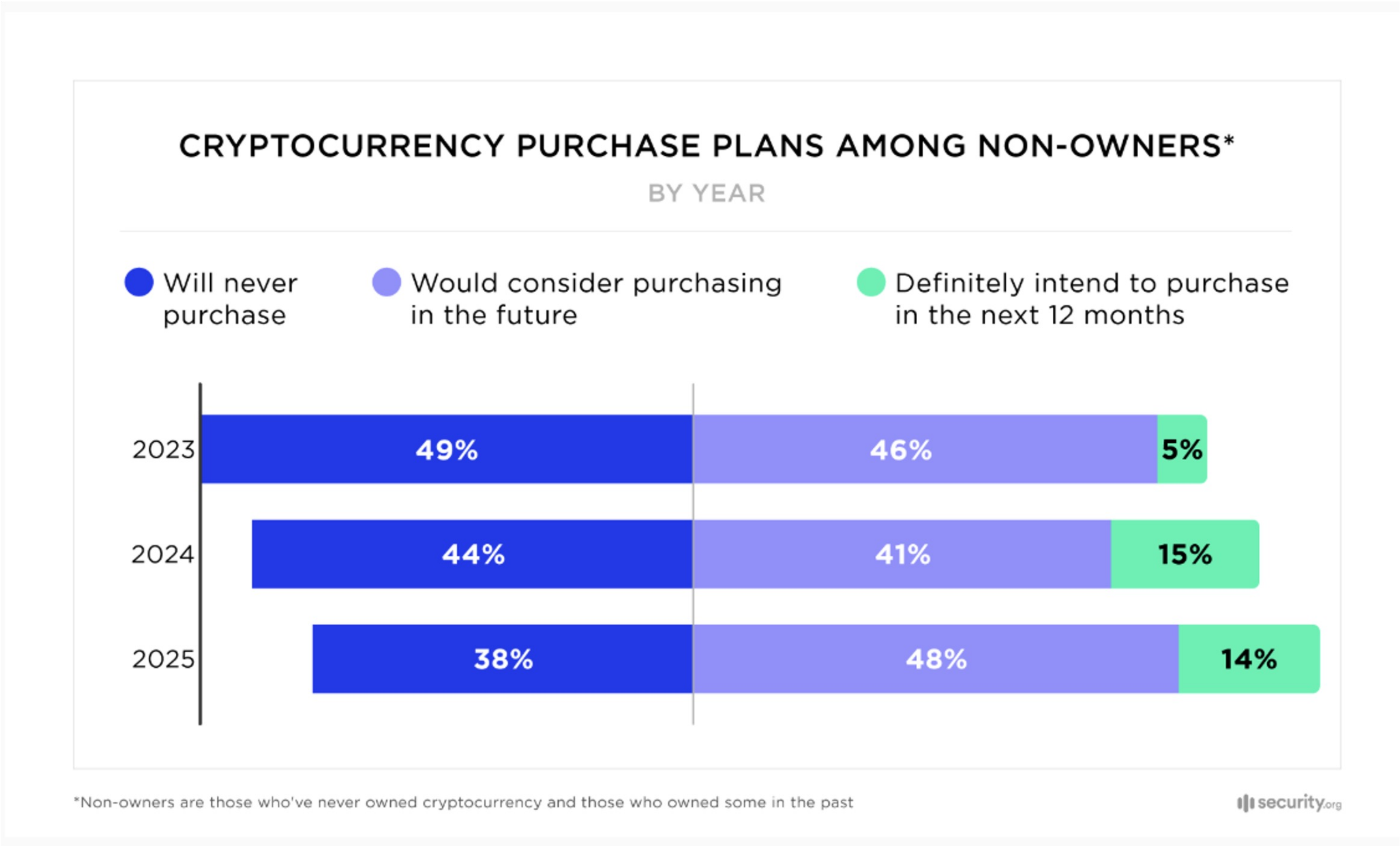
July 2025

How do Americans view it

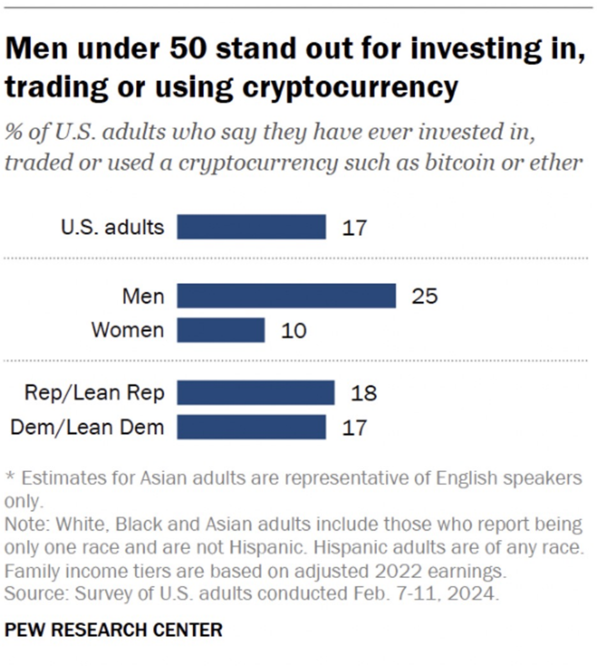




How much is crypto ownership growing?



Crypto as a Voter Issue



What do you think is the most important problem facing the country today?

Recent trend

	Jul-25	Jun-25	May-25	Apr-25	Mar-25
	%	%	%	%	%
ECONOMIC PROBLEMS (NET)	**27**	**33**	**35**	**39**	**38**
Economy in general	12	13	16	17	19
High cost of living/Inflation	7	8	8	11	9
Federal budget deficit/Federal debt	5	7	3	5	4
Gap between rich and poor	2	2	1	1	2
Taxes	1	1	1	1	2
Lack of money	1	1	2	1	1
Unemployment/Jobs	1	2	3	3	2
Foreign Trade/Trade deficit	1	2	4	5	1
Corporate corruption	1	1	*	*	*
Wage issues	1	1	1	1	2
Fuel/Oil prices	1	*	*	*	*
NON-ECONOMIC PROBLEMS (NET)	**78**	**73**	**70**	**66**	**71**
The government/Poor leadership	26	25	26	28	27
Immigration	16	20	13	12	14
Judicial system/Courts/Laws	6	5	5	3	4
Elections/Election reform/Democracy	6	5	4	4	4
Race relations/Racism	6	5	5	2	2
Unifying the country	6	5	4	5	5
Ethics/moral/religious/family decline	4	2	2	3	1
Poverty/Hunger/Homelessness	3	3	3	1	3
Healthcare	3	2	2	1	1
Education	3	2	2	2	2
Lack of respect for each other	3	2	2	1	2
Wars/War (nonspecific)/Fear of war	2	1	1	2	1
The media	2	1	2	1	*
Foreign policy/Foreign aid/Focus overseas	1	1	2	2	3
Police brutality	1	--	--	--	--
Crime/Violence	1	2	3	2	2
War in the Middle East	1	*	*	*	*
Care for the elderly/Medicare	1	1	1	*	*
Welfare	1	*	1	--	*
Drugs	1	*	1	*	1
Environment/Pollution/Climate change	1	*	1	*	1
National security	1	1	1	1	1
Terrorism	1	*	1	1	1
International issues, problems	1	1	1	1	3
Situation with China	1	1	*	1	1
Abortion	*	1	1	1	*
Natural disaster response	*	*	--	--	--
Situation with Russia	*	1	*	*	1
Cancer/diseases/viruses	*	*	1	*	*
Children's needs	*	*	--	--	*
Social Security	*	--	1	*	1
Lack of military defense	*	*	*	*	*
Guns/Gun control	*	*	1	*	*
Energy/Lack of energy sources	*	--	*	*	--
Advancement of computers/technology	*	*	*	--	*
School shootings	*	--	*	*	--
Infrastructure	*	*	*	--	*
LGBTQ rights	*	1	1	*	1
Other non-economic	5	3	6	4	7
No opinion	2	1	*	*	*
Total	140%	131%	135%	125%	134%

* Less than 0.5%; Percentages total more than 100% due to multiple mentions.

GALLUP

State Digital-Asset and Crypto Regulatory Initiatives (select)

New York: BitLicense regime (since 2015)
California: Digital Financial Assets Law (passed 2023)

Wyoming: SPDI (Special Purpose Depository Institution) charter (since 2019)
Wyoming Stable Token program
Nebraska: Digital Asset Depository Charter (since 2021)

Oklahoma: Digital-asset kiosk licensing regime (since 2025)

New Hampshire: State reserve program allowing BTC holdings
Arizona: State reserve and unclaimed-property crypto pilot

Current Bills

1. **GENIUS Act**: Stablecoins (signed into law)
2. **Clarity Act**: Market Structure
    a. Passed House
    b. Senate has RFIA draft (Senate Banking only)
    c. No companion Agriculture/Commodities draft
3. **Anti-CBDC Act** (passed House only)

GENIUS Act Overview

1. **Stablecoins** that are **privately issued, dollar-pegged by companies, not protocols**
2. 3 paths for issuing: **Bank Subsidiary, OCC Charter, State Issuer**
   a. **State Issuer:** Less than $10B and certified by federal committee
3. **Bank-style prudential oversight**, means high compliance costs
4. **Big Gaps:**
   a. Secondary markets are unregulated
   b. Not bankruptcy remote
   c. No FDIC Insurance
   d. No onchain transparency
   e. Depegging risk

What Is Not Being Addressed

1. **DeFi (**Decentralized Finance**)**
2. **web3**
3. **Tokenization**
4. **NFTs (**Non-Fungible Tokens)
5. **Illicit Activity**
6. **CBDCs Competition**
7. **Memecoins**
8. **Rehypothecation**
9. **Security/Technology Standards**
10. **Open-Source and Permissionless v. Permissioned**

Thank you!

Q&A

Division of Financial Institutions

2025 Digital Currency

Agenda

- Digital Currency Regulatory Landscape In Hawaii
- Stablecoins/Genius Act
- Concerns
- Recommendations

Digital Currency regulatory landscape In Hawaii:

WHERE WE STARTED

- **2010s**: Virtual currency (VC) deemed to be money transmission under Hawaiʻi law.
- **Licensing Challenges**: VC assets didn't qualify as permissible investments; companies were required to hold cash reserves.

Digital Currency regulatory landscape In Hawaii:

LESSONS LEARNED

01

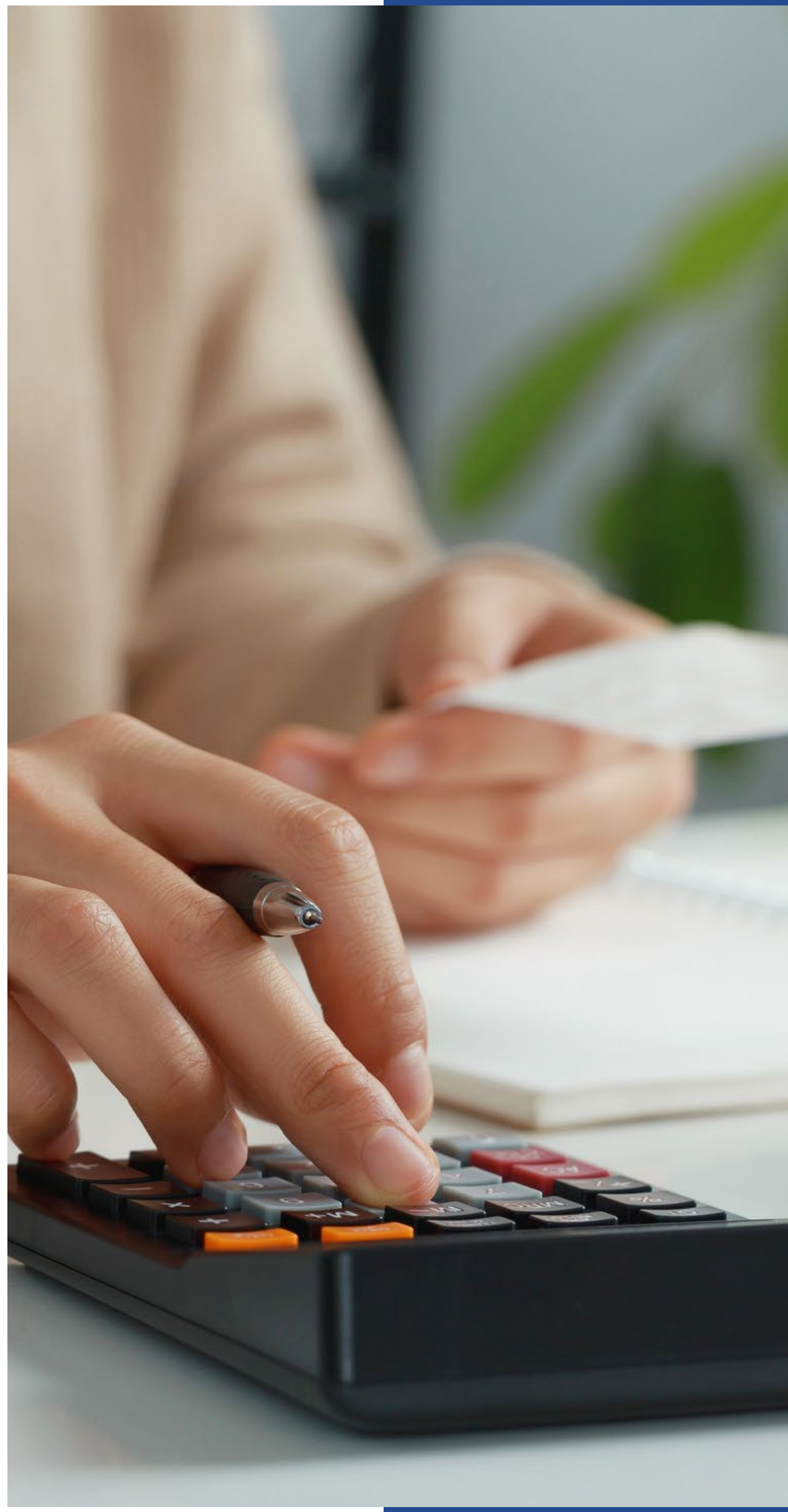
Digital Currency Innovation Lab (DCIL):

- Launched in 2020 by DFI and HTDC as a safe harbor to study digital currency activity.
- Allowed VC companies to operate without a money transmitter license.
- Concluded in June 2024.

02

Lessons Learned:

- VC not used to move or transfer value
- VC used as an investment
- Doesn't fit into HRS 489D (HI Money Transmitter law)



Digital Currency regulatory landscape In Hawaii:

WHERE WE ARE NOW

01

2023: SB945 – Related to digital currency passed, but was later vetoed due to funding issues

- CRF lacked funds to start up program
- Not enough companies to support the cost of regulation
- No funds allocated to stand up a new program

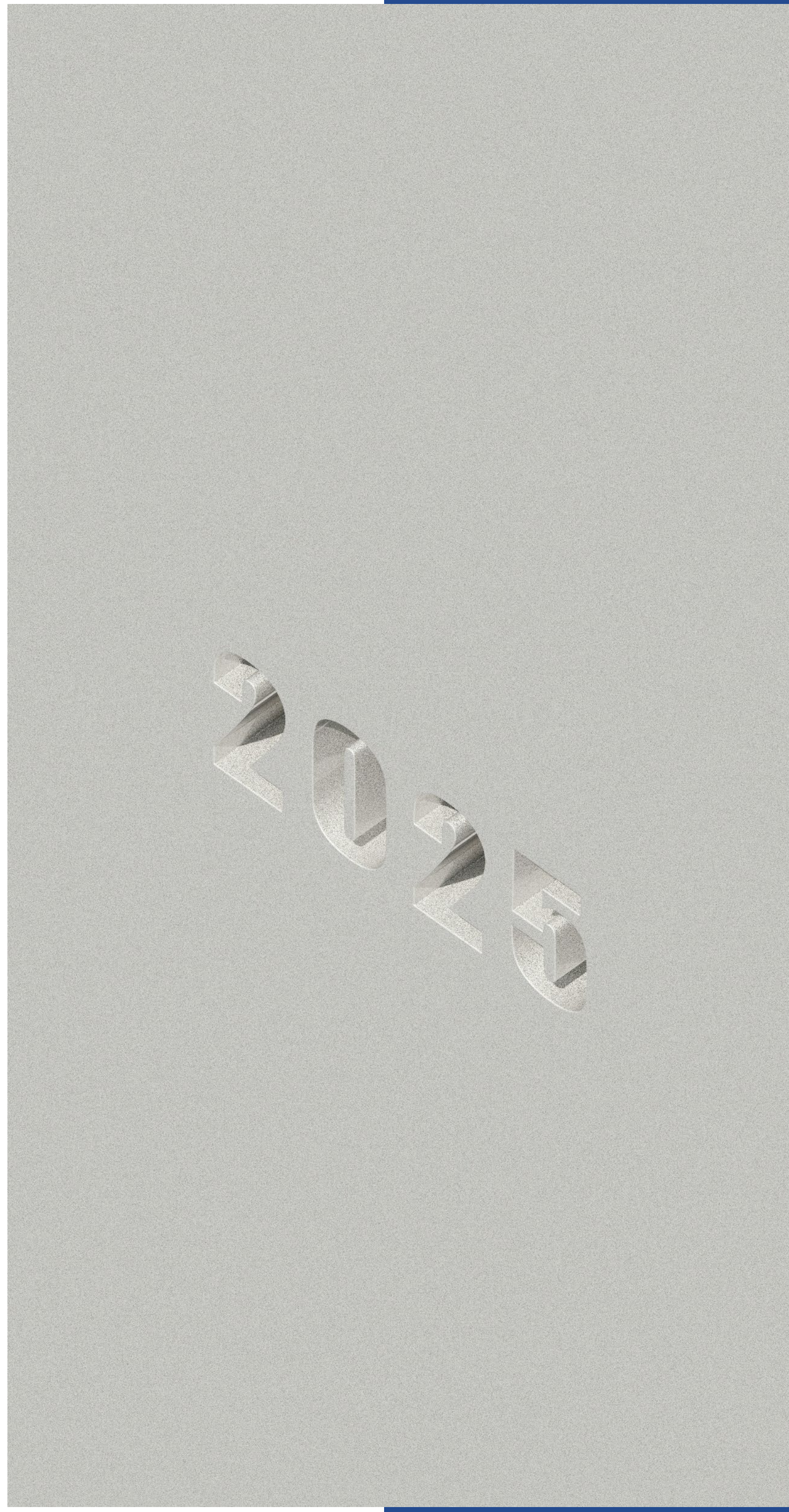
02

Current Status: Digital currency companies may operate in Hawaiʻi without a state-issued money transmitter license

- Does not fit the definition of money transmission
- Must comply with federal requirements (e.g., FinCEN, SEC, FINRA).

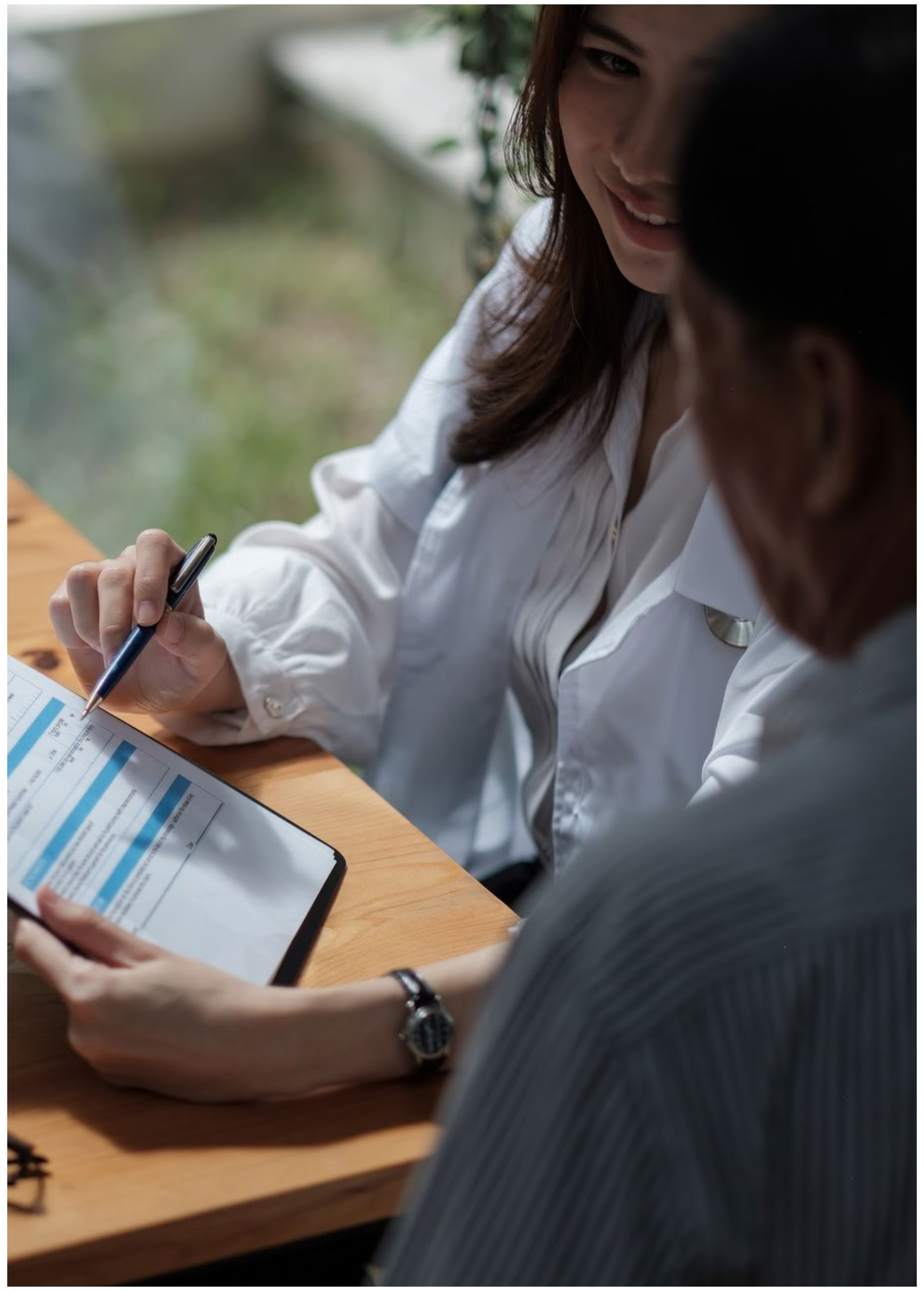
03

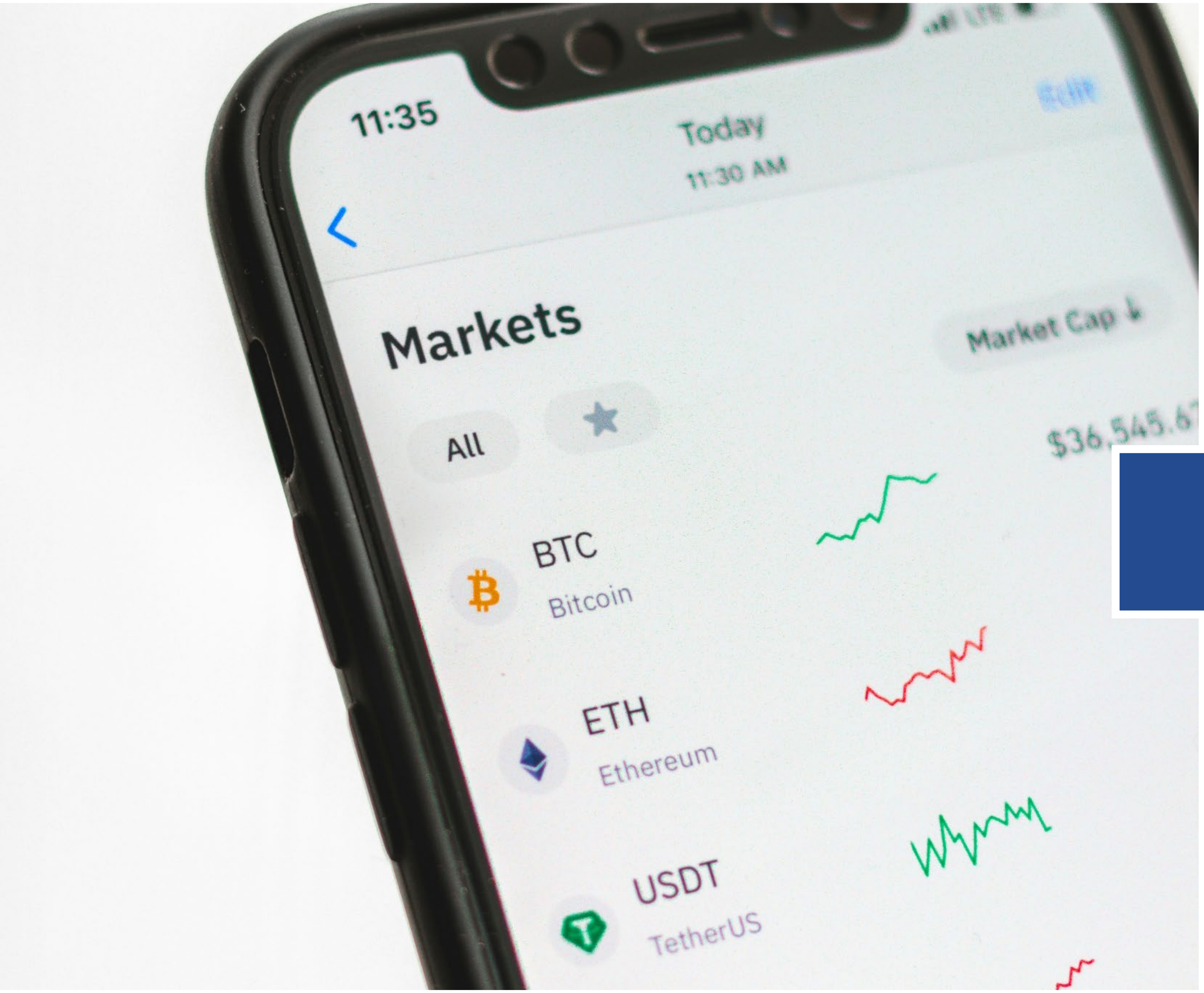
Guidance posted on the Governor’s and DFI’s websites.



Stablecoins and the GENIUS Act

1. **Definition**
2. **State Regulation**





GENIUS Act: What is a “payment stablecoin”?

- The term “payment stablecoin” means a digital asset:
- Designed to be used as a means of payment or settlement;
  - The issuer of which,
    - is obligated to convert, redeem or repurchase for a fixed amount of monetary value; and
    - will maintain a stable value relative to the value of a fixed amount of monetary value; and
    - is not a national currency, deposit or otherwise a security.

Stablecoins are Not:

- Fiat Currency
- FDIC insured

State-Level Oversight:

- Under the GENIUS Act, issuers under $10B in circulation may opt for state regulation
  - State level regulation is subject to approval by the Stablecoin Certification Review Committee and must be substantially the same as the GENIUS Act.
- GENIUS will preempt current state VC laws and portions of state money transmitter laws that address VC.
- Genius Act requires nationwide uniformity.

GENIUS ACT- Stablecoin Regulation

Passed: July 18, 2025:

Effective Date - The Earlier Of:

- **January 18, 2027 (18 months post-enactment), or**
- **120 days after final federal regulations are issued (no timeline yet)**

GENIUS Act: Key Provisions

1. Federal preemption for issuers with $10B+ in circulation.
2. $10B or less "…may opt for regulation under a State-level regulatory regime provided that the State-level regulatory regime is substantially similar to the Federal regulatory framework…" Section 4(c)(1)
3. State's authority to regulate stablecoins is subject to the Stablecoin Certification Review Committee
4. Oversight by a Stablecoin Certification Review Committee.
5. State regulation must be approved by federal regulators.
6. State laws on stablecoins will be preempted by GENIUS Act.
7. State laws on other cryptocurrencies may be preempted by Clarity Act.

Concerns & GENIUS Act

- Challenges with Proposing New Legislation Currently:
  - The GENIUS Act passed but the federal regulators have not issued the final implementing regulations.
  - Any state regulatory framework must align with the GENIUS Act and must be certified.
  - A stablecoin issuer opting to be regulated by a State regulator is allowed to operate in all 50 States.
  - State regulator will likely be responsible for consumer complaint in all jurisdictions.

Resource Constraints

Cost of hiring examiners with crypto/IT expertise is prohibitive.

FRB: $131,000 - $202,000

State of NY: $67-$83,000

State of CA:

- $50-$85,000
- $96-$125,000
- Anticipate a revolving door

Uncertainty around attracting qualified talent.

NY has about 60 staff to supervise about 30 licensees

CA currently has 7 staff, and cannot hire until the program self funds

- CA's VC law passed in 2023 and becomes effective 7/1/2025 (a one-year extension was granted until July 2026).
- Budgeted for 23 staff.
- May have 170 licensees (this number includes crypto ATMs)

Hawaii DFI's projected start up expenses:

4 Examiners:

- 2 licensing examiner
- 2 field examiners

Blockchain analytics subscription to monitor blockchain activity: $100,000+/annually

Anticipated revenue: $0.0

- Stablecoin operators will elect the OCC or a State they are already licensed in
- Clarity Act will push non stablecoin operators to the SEC or CFTC

Other Digital Asset Matters

Fed Proposals Currently Moving

- CLARITY Act
  - Will likely mirror the federal restrictions in the GENIUS Act
  - Clarity Act will place the non stablecoin operators under the supervision of the Securities and Exchange Commission (SEC) and the Commodities Futures Trading Commission (CFTC).
    - This implies that this activity is not money transmission, but investing.
    - This is consistent with what we learned from the DCIL.

Resource Constraints:

- Are the same as noted above with stablecoin legislation
  - Cost of hiring examiners with crypto/IT expertise is cost prohibitive.
  - Uncertainty around attracting qualified talent.
  - Uncertainty of having enough licensees to maintain the program.

Recommendations:

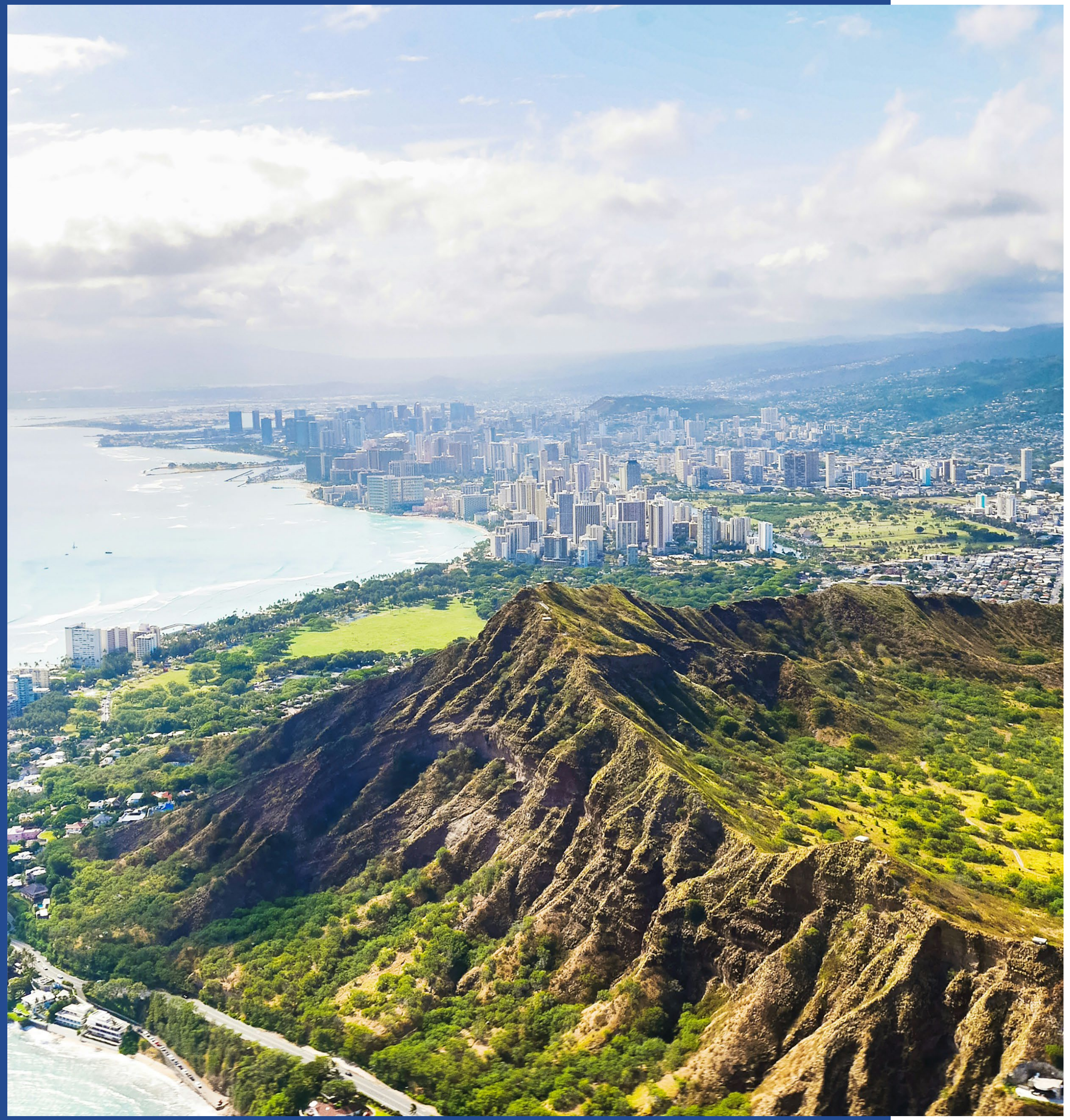
- **Wait for the GENIUS final rule making to be complete.**
- **Wait to see if the Clarity Act passes.**

GENIUS Act:

- Any State regulation is subject to the approval of the Stablecoin Certification Review Committee
  - Feds have not issued final implementing regulation
  - Must be substantially similar to the GENIUS Act
- Consumer protection is provided
  - Federal: Office of the Comptroller of the Currency (OCC)
  - Regulating State

Clarity Act:

- Many provisions may be similar to GENIUS with federal oversight from the SEC and CFTC



Recommendations:

- A Stablecoin issuer will likely choose the federal regulator or a State where they are already licensed
  - To prevent the industry from having to deal with 50 state laws, a company will only need one license. Either from a state, or from the federal gov.
- Consumer protection:
  - GENIUS Act does not preempt state consumer protection laws.
- Funding and standing up a program could result in no licensees.
- No word on potential stablecoin issuers in the state of HI.
- DFI is not equipped to manage nationwide complaints.

Contact Us

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