# Bitcoin Cheat Sheet ₿

## World's first public digital cash infrastructure

## Send and receive value to anyone in the world using a computer connected to the internet

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### INVENTOR

**Satoshi Nakamoto**

Pseudonymous group/person who developed Bitcoin, authored Bitcoin white paper (2008), and deployed the Bitcoin software code [1]

### CASH INFRASTRUCTURE

**1st**

World's first crypto currency = **b**itcoin (lowercase "b") [2]

World's first public blockchain network = **B**itcoin (upper case "B") [3]

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### SUPPLY

**21 Million**
**Maximum Supply**

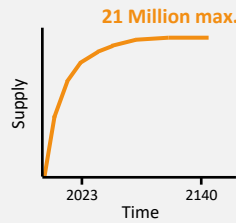**92% is already mined**

**19.4 Million**
**Issued Supply** [4]

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### CONSENSUS MECHANISM

**Proof of Work**

- Miner use computing power to solve complex math problems

- Winner has right to verify next block of transaction and collects reward

- Outcome: Transactions on blockchain are verified and verification efforts are rewarded [5]
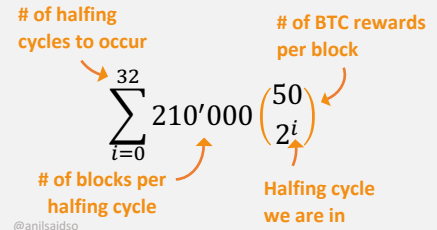
### ISSUANCE



21 Million max.

Supply vs Time (2023 – 2140)

Current block reward is 6.25 bitcoin
Approx. 1 Block is verified/10min [6]

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### BLOCK REWARD HALVING

# of halfing cycles to occur

# of BTC rewards per block

$$\sum_{i=0}^{32} 210{'}000 \left( \frac{50}{2^{i}} \right)$$

# of blocks per halfing cycle

Halfing cycle we are in

@anilsaidso

1 Block/10min ~ 1 halfing every 4 years
Next block reward is 3.125 bitcoin [7]

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### MINING

**Energy | Hardware | Internet**

- Energy used to power and cool equipment
- Mining hardware ASIC for computation
- Internet network with low latency [8]

### MINING REVENUE

**$47.4 Billion**

Cumulative Bitcoin mining revenue [9]

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### BITCOINS LOST

**~ 6 Million (est.)**

Approx. 4% of bitcoins lost each year. e.g., loss of private key, seed phrase, and transfer to non-managed address [10]

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### ADDRESS TYPES

Legacy (First type) — e.g. 12c6…rJX
Segwit (Low fee) — e.g. bc1q…pbb
Compatibility (Flexible) — e.g. 36JK…5Aq

Series of numbers/letters (~30 characters) used to record ownership of bitcoins on the blockchain [11]

### WALLET

- App which generates, stores, and protects your private key, public key, and bitcoin address
- Does not hodl your bitcoins, but manages your private key ("password") and corresponding public key ("username")

### CUMULATIVE ADDRESSES

**43.2 Million**

Cumulative Bitcoin addresses with non-zero balance [12]

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### PREMINE [13]          **0 %**

### BLOCK SIZE [14]       **2 - 4 MB**

### TRANSACTION TIME      **~ 10min**
(Block time: 1 Confirmation) [15]

### UNITS & SYMBOLS

| UNITS | SYMBOL | BITCOIN VALUE |
|---|---|---|
| bitcoin | BTC, XBT or ₿ | 1 |
| satoshi | sat | 0.00'000'001 |

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### LINGO          BITCOIN CULTURE

**GM***          **Anti-centralisation**
**HODL****       **Minimalistic**

*good morning, **hold on for dear life [16]

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### COUNTRY ADOPTIONS

1. Vietnam
2. Philippines
3. Ukraine
4. India
5. United States
6. Pakistan

Measured where most people have biggest share of their money in crypto [17]

### NETWORK UPTIME

**99.98826 %**

Since inception on
January 3, 2009 02:54:25 GMT [18]

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### PROS & CONS

**+**
- Secure
- Global
- Access

**−**
- Volatility
- Acceptance
- Transaction rate

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## Bitcoin is available to all and not owned & controlled by any single entity

# Ethereum Cheat Sheet

## Leading public digital infrastructure for decentralised applications and smart contracts

## Proof digital ownership and create programmable money without a centralised institution

## INVENTOR

### Vitalik Buterin

Published the Ethereum white paper (2014) when he was 19 years old and co-founded among others the Ethereum protocol [1]

## APPLICATION INFRASTRUCTURE

**Decentralised Apps** Software programs that run on a blockchain network, rather than on a single computer (dApps) [2]

**Smart Contracts** Immutable contracts that automatically execute transactions once certain conditions are met [3]

## COIN VS TOKEN

A coin is native on its own blockchain, whereas tokens rely on another blockchain [4]

### Coin
⬥ Ether (ETH)
on Ethereum
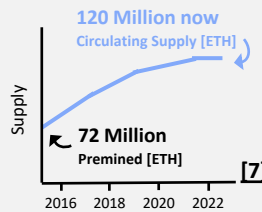
### Tokens
Link, DAI, wBTC
on Ethereum

## SUPPLY

Circulating Supply **120 Million** [5]
Comparable to available shares in the market

Maximum Supply ∞ [6]
Comparable to issuable shares in the market

**Circulating Supply** = ETH Issued − ETH Burned
**Deflationary** = ETH Issued < ETH Burned

## ISSUANCE

**120 Million now**
Circulating Supply [ETH]

Supply

**72 Million**
Premined [ETH] [7]

2016  2018  2020  2022

ETH issuance rate per day ~ 1'900 ETH [8] given 20 Million ETH are staked [9]

## COIN BURN

### Burn

Existing ETH get destroyed by sending the coins to an address from which they cannot be retrieved

### Burn Rate

ETH burn rate per day ~ 3'400 ETH [10] given avg. gas of 16 gwei/day [11]

## NETWORK PROTECTION

### Proof of Stake (PoS)

- Validators stake (lock up) ETH which can be destroyed in case of wrongdoing
- Randomly selected validator proposes next block while other random validators verify block of transactions
- Block proposal and verification is rewarded with ETH (Staking Reward) [12]

## STAKING

- Allows ETH holders to earn rewards while staking ETH for a time period
- The staked ETH are used to achieve consensus with the underlying PoS mechanism
- ETH issuance via staking rewards ~ 4.6% p.a. of staked amount per holder [13]

## ENERGY CONSUMPTION

**− 99.988%**
From 90 to 0.01 TWh/yr

ETH PoW          ETH PoS
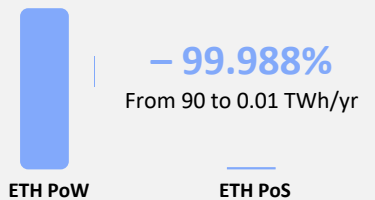
Energy reduction after upgrade [TWh/yr] [14]

## TOKEN STANDARDS

### ERC-20
Fungible Token
Interchangeable (FT)

### ERC-1155
Hybrid
Both FT & NFT

### ERC-721
Non Fungible Token
Numbered Tokens (NFT)

### ERC-777
Mixer
Extra Functionality [15]

## ICO

### Initial Coin Offering

Type of equity fundraising (similar to IPO) using crypto tokens/currencies, but besides stake in the company, coins issued have utility for a product or software service [16]

## GAS FEES

Dynamic & required for transactions on Ethereum Paid in Ether (ETH), denominated in gigawei

### Base Fee
Minimum amount for a transaction. Subsequently burned.

### Priority Fee (Tips)
Additional tip to prioritise your txn. Kept by validator. [17]

## PREMINE [18]          72 Million

## BLOCK SIZE [19] ~ 1MB (15M gas)

## BLOCK TIME          12 seconds
Transaction time: 1 – 15 min [20]

## WALLET

An app for managing your funds, your Ethereum account, and your login to Ethereum dApps

**Types of wallets** Mobile applications, browser extensions, physical hardware wallets [21]

## CUMULATIVE ADDRESSES

**101 Million**
WITH NON-ZERO BALANCE

**24 Million**
BALANCE ≥ 0.01 ETH

Cumulative Ethereum addresses [22]

## UNITS & SYMBOLS

| UNITS | SYMBOL | ETH VALUE |
|-------|--------|-----------|
| ether | ETH | 1 |
| gwei | shannon | 0.000'000'001 |

[23]

## CHALLENGES

- **Scaling layer-2 (L2)**
- **Wallet security**
- **Privacy preserving**

⊖

[24]

## BENEFITS

- **Peer-to-peer global payments**
- **Proof digital ownership**
- **Programmable money**

⊕

[25]

## A platform for Developers, Investors, Companies, Artists, Writers, Gamers and more

# Stablecoin Cheat Sheet

## Less volatile crypto currencies backed with reserve assets

### Faster transactions and reduced fees for global money transfers and credit card payments

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## MOST POPULAR

### Tether USDT

Fiat-collateralized stablecoin, a token initially launched on the Bitcoin network (2014), used for international payments, to stabilize funds on-chain and to transact across platforms **[1]**
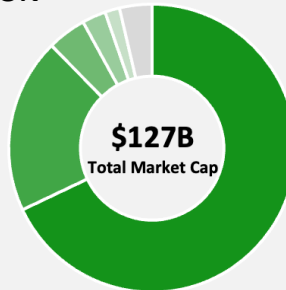
## TOKENISED REAL WORLD ASSET

**Stablecoins** are digital assets on public blockchains whose value is based on (pegged to) the value of the backing reserve asset.

**Reserve Assets** are mainly off-chain asset classes e.g., cash, short-term debt, and gold **[2]**

## TYPES

**Fiat**
**Crypto**
**Commodity**
**Algorithmic**

## RESERVE ASSET

Cash & short-term debt
Other Cryptocurrencies
Gold, Silver, Crude Oil
Non collateralized

**USD dominates stablecoin reserves (>95%)**

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## SUPPLY

Total Market Cap **$127 Billion**
Sum of 126 stablecoins x their value (USD)

Total Value Locked **$81 Billion**
Sum of reserve assets value of 126 stablecoins

**Mcap / TVL = 1.6**

**USDT Dominance = 69%** **[4]**

## DISTRIBUTION

- **USDT, 68%**
- **USDC, 19%**
- **DAI, 4%**
- **TUSD, 3%**
- **BUSD, 2%**
- **Others, 4%**

**$127B** Total Market Cap

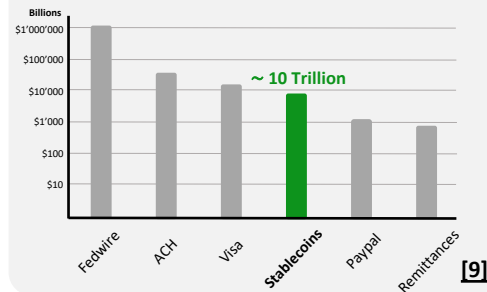blockguide.eth **[5]**

## LIFECYCLE

### Minting

Real world asset is deposited as a reserve asset via a financial institution. The same value amount of stablecoin tokens is minted on-chain

### Redemption

Holders can redeem their stablecoins at the conversion rate in exchange for the reserve asset. Minting & redemption = on- / off-ramp **[6]**

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## USE

### Only 10%
of crypto market capitalization

### But 70-80%
of on-chain transaction value (USD)

### While 10 Million
monthly active on-chain users trending up **[7]**

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## DEPEGGING

**Deviation from pegged value**

### Causes For Depeg Events

**Liquidity stresses**
Sudden demand or supply changes

**Impairment of reserves**
Shortfall in collateralization triggers a loss of confidence and result in sell off **[8]**

## TRANSACTION VALUE 2023

Billions

~ 10 Trillion

Fedwire, ACH, Visa, **Stablecoins**, Paypal, Remittances **[9]**

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## CBDC

### Central Bank Digital Currency

- Digital form of a country's fiat currency
- Issued by governments central banks
- Backed by faith & credit of the government
- Use private centralised blockchains **[10]**

## CBDC COUNTRY TRACKER

### 130 Countries Exploring
Representing 98% of global GDP

### 21 Pilots & 11 Fully Launched
9 of the G20 countries are in pilot stage **[11]**

## PROGRAMMABLE MONEY

### Conditional & Automated

CBDCs & crypto currencies can be programmed via smart contracts, facilitating conditional or automated payments based on preset rules **[12]**

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## INFLATION

### 30% Increase of CPI

Total increase in prices (CPI inflation) of goods & services in the US from 2013 -2023 **[13]**

## FLATCOIN

### Pegged to Cost of Living

A stablecoin w/o reserve assets, linked to an inflation index e.g. CPI, linked via oracles **[14]**

## ORACLES

### Off-chain 🔗 On-chain

Connect world data to blockchains e.g., CPI, reserve assets, weather data, sport scores **[15]**

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## ENTERPRISE ADOPTION

- **VISA** using **USDC** on Solana & Ethereum
- **PayPal** launched own stablecoin **PYUSD**
- **Stripe** using **USDC** for creator pay outs

**[16] [17] [18]**

## CHALLENGES

- **Deviation from pegged collateral**
- **Access to on- / off-ramps**
- **Merchant & people acceptance**

blockguide.eth **[19]**

## BENEFITS

- **Less volatile**
- **Settled in minutes**
- **Near-zero cost**
- **Fully programmable**

**[20]**

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### The evolution of money from physical to digital to verifiable