

PennyDAO: A Protocol for the Validation, Minting, Issuance, Transfer, and Management of Various Stable Tokens Based Around Physical Pennies, with Accompanying Ecosystem

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Abstract: PennyDAO will be primarily based around a stable token backed by physical pennies. Individuals will submit physical pennies for permanent deposit, and in return will receive the penny token, which will be backed by the physical pennies that are held by the DAO. The token may be used the same as any other stable coin, but the physical penny deposit itself will not be redeemable. The DAO is primarily hosted on the Bitcoin Blockchain, using the Counterparty L2 Protocol. The DAO provides for the creation, distribution, sale, and management of a variety of tokens that represent the various forms of value that are found in a penny. The PennyDao Ecosystem will be based around ways to incentivize token holders to voluntarily burn their penny tokens, which will then allow the DAO to resell that token on the open market in order to generate revenues.

1. Introduction

1.1. What is PennyDAO

PennyDAO is an ecosystem based around a series of penny backed stable tokens and numismatic NFTs.

Users deposit physical United States Pennies into a secure vault system. For every accepted penny, the protocol mints a fungible Penny token with a floor price pegged to 0.01 USD. In addition, fungible tokens backed by the metal value of the penny may be issued as well. These tokens would be denominated in grams of either copper or zinc. When applicable, non-fungible

tokens backed by the numismatic value of the underlying physical penny may be issued as well. The Penny token is intended to behave like a familiar stablecoin that can circulate on decentralized exchanges, in DeFi protocols, and be used for payments. PennyDAO can only ever have as many Penny tokens in circulation as there are physical pennies on deposit. However, if token holders decide to burn their Penny tokens, the DAO may resell those burnt tokens onto the open market in order to generate revenues. Third parties will be encouraged to implement various incentive structures to incentivize holders into burning tokens, and the DAO will create a reference implementation called the “Pennyverse”. The Pennyverse will be a custom metaverse that requires the burning of Penny tokens in order to build within the environment.

1.2. Vision

The long term vision is a global ecosystem where pennies are aggregated, secured, and financially productive, while the Penny token moves freely in crypto markets and the Pennyverse grows as a cultural layer around it. In pursuit of this vision, PennyDAO aims to do the following:

- Preserve the cultural and historical legacy of the penny
- Save forgotten coins sitting in jars and drawers by turning it into a modern digital money primitive
- Build a playful penny based world, online and offline, that uses pennies as its base atomic unit
- Provide a safe, reliable, penny-backed stable token that integrates with the broader DeFi stack

1.3. Design Principles

The underlying structure of PennyDAO will be based around these principles:

- **Simple and Secure collateral** - prioritize safety and clarity over yield
- **Hard supply discipline** - never issue more Penny tokens into circulation than physical pennies on deposit
- **Non speculative by design** - no tradable “governance” tokens that promises profits to retail investors
- **Composable** - the Penny token should behave like any other stablecoin in all DeFi applications
- **Fun at the edges** - A PennyDAO community will be fostered through online interaction in the Pennyverse, as well as in the real world through art installations and events or conference participations

2. System Overview

2.1. Key Actors

The PennyDAO ecosystem will be composed of various participants, with their own unique incentives and interests. The following is a list of the primaries:

- **PennyDAO**
 - The governing body of the ecosystem. An on-chain DAO with a Wyoming DAO LLC wrapper that manages policy and treasury
- **Depositors**
 - Individuals, businesses, and partners who send physical US pennies to be held on permanent deposit.
- **Vault operator(s)**
 - Professional stewards that store and secure the physical coins.
- **Token holders**
 - Users or protocols that hold or the various PennyDAO tokens
- **Numismatic participants**
 - collectors, lenders, and institutions with an interest in rare coins
- **Builders and partners**
 - projects that integrate the Penny token or build in the Pennyverse
- **Regulators**
 - Individuals or organizations with the power to use government violence, or the threat of government violence, in order to coerce various entities to act in accordance with the restrictions and obligations put forth by said government. In order to avoid the risk of falling victim to potential government violence, PennyDAO will be implemented in a way that is fully compliant with all regulatory requirements and obligations.

2.2. High-Level Flow

A specific and orderly process will be created in order to facilitate the deposit of the physical pennies, and the subsequent issuance of the relevant tokens:

1. A depositor submits physical US pennies to PennyDAO intake points or partners. The depositor also provides a Bitcoin address where they would like PennyTokens minted from their deposit to be sent.
2. After basic screening, counting, authenticity checks, and basic sorting for copper content, the pennies are added to an “unserialized batch”.
3. Once authenticity and count is confirmed, the appropriate number of Penny tokens will be minted and sent to the depositor’s BTC address. The depositor receives the Penny tokens in their wallet, subject to transfer rules described later. An issuance record is maintained automatically on the blockchain.

4. As time allows, pennies in the unserialized batches are all individually photographed and scanned on each side. A unique barcode is then applied to the penny in a way that does not treat or permanently damage the penny, so that it may be serialized in order to facilitate future recall from storage if necessary.
5. The batches of newly serialized pennies are then moved into fully serialized inventory.
6. Copper and Zinc stable tokens backed by the metallic value will be minted and issued as applicable, based on the physical pennies on deposit.
7. A numismatic NFT will be minted and issued for any penny that is scanned and identified as rare or special.
8. Physical pennies are non-redeemable and remain in custody permanently. The physical pennies will be held permanently by the DAO in a secure manner, such that the general public may be able to readily see and inspect the physical pennies being held in permanent deposit with the DAO. The pennies being held may be formed into interesting artistic displays to increase the interest for people to come see it and promote the local community where they are being securely held, as long as the physical integrity of the pennies remains intact.
9. The DAO generates revenue by incentivizing token holders to burn their penny tokens, which can then be re-issued by the DAO and sold on the open market. Secondary and tertiary revenue sources may be achieved through the use of the metallic backed tokens and numismatic NFTs. Additional treasury usage may be explored as well, as regulations allow.

3. Asset and Token Model

3.1. Physical Pennies

Initially, PennyDAO will accept only United States one cent coins.

- Any year and composition may be accepted, subject to basic screening
- Coins are grouped into:
 - **Unserialized batches** - new inflows not yet fully indexed
 - **Serialized inventory** - coins that have been counted, categorized, serialized, indexed, and linked to on-chain records
- Pennies are stored in professionally secured vaults with appropriate security guard personnel and insurance
- Pennies will ultimately be stored in a centralized secure facility, and are not routinely shipped back and forth - minimizing handling protects the assets and reduces cost
- Because the terms dictate that there is no option for redemption of the physical pennies once they are deposited, they are considered assets, as

opposed to liabilities like with redeemable stable tokens. This distinction allows for more creative freedom when setting up the tokenomic structure.

3.2. The Penny Token (Fiat Value Stable Token)

The Penny token is a fungible, blockchain based asset, representing the fiat value of one physical US penny held by PennyDAO.

- **Peg** - Floor price of the Penny token is set to \$0.01 USD, backed by the physical penny being held on deposit.
- **Issuance Rule** - 1 Penny token may be minted only when 1 physical penny is accepted into inventory or when a previously existing Penny token is burnt by the holder.
- **Supply Cap** - Total Penny token supply in circulation may never exceed the number of physical pennies on deposit
- **Non Redemption Guarantee** - The Penny token is not a direct deposit receipt that guarantees redemption of any kind.
- **Example Use Cases** - Stable unit of account, means of exchange, DeFi building block, in-game currencies with real-world value, treasury assets, metaverse resource management, etc...

In practice, market prices on AMMs, DEXs, and other venues may float slightly due to liquidity conditions and variation in supply/demand ratio. The peg is enforced at the policy and collateral level, not by promising automated redemption at par. The preferred ticker for exchange purposes will be determined based on availability at the time of listing.

3.3. Copper and Zinc Tokens (Metallic Value Stable Token)

Each penny has a specific metal composition, based on the year it was minted. U.S. pennies minted before 1982 weigh 3.1g, and are comprised of 95% (2.95g) copper / 5% (0.15g) zinc. Pennies minted midway through 1982 or later weigh 2.5g and are comprised of 2.5% (0.06g) copper / 97.5% (2.44g) Zinc. PennyDAO mints a fungible metal-backed stable token that represents the metallic value of the underlying physical penny. The total number of pennies required to make up the one-gram of material needed to mint one Zinc or Copper token will depend on the year the pennies were minted.

The Metallic Value token may be used as a basic stable token in the same way as the Penny token, however it would be denominated in grams of copper or zinc instead of USD. The Metallic Value tokens may be used as input to lending, recycling, or metals related markets, as well as traded on exchanges in the same way as any other stable token. The preferred ticker representing

the Zinc and Copper tokens for exchange purposes will be ZNPD and CUPD, respectively. The “ZN” and “CU” portions stand for copper and zinc, and the “PD” indicates that these tokens are part of the PennyDAO ecosystem.

3.4. Numismatic NFTs

Some pennies have a numismatic value that exceeds both the face value and metallic value of the physical penny. PennyDAO mints and issues a unique Numismatic NFT to represent this value. The Numismatic NFT is a 1-of-1 token that is linked to a specific serialized physical penny held in serialized inventory. Each Numismatic NFT will contain all pertinent attributes of the specific physical penny it is linked to, such as, year, mint mark, grade, rarity, provenance, photos, auction/sale history of the physical penny, etc...

Revenue and financing models may include:

- Numismatic NFTs used as collateral for loans against the appraised value
- Auctions, buyouts, or sales where proceeds flow according to set formula
- Direct sale onto the open market

3.5. Supply, Redemption, and Claims

Core rules:

- The DAO may never mint more Penny tokens into circulation than physical pennies on deposit.
- When Penny tokens are permanently burnt, the DAO may reissue an equivalent amount and sell them on the open market, provided the physical penny backing remains intact.
- Token Holders hold Penny tokens and NFTs but are informed that:
 - Once the Holder transfers or sells any of these assets, they effectively transfer their economic interest.
 - The tokens represent the value stored within the physical penny, but do not provide the ability to redeem the token in exchange for the physical penny.

Specific penny retrieval:

PennyDAO intends to support identification and prompt retrieval of each individual penny from the serialized inventory for purposes including but not limited to auditing, inspection, or public demonstration.

- Coins move from an unorganized batch to an organized, serialized inventory as part of the intake process.
- Only serialized coins with appropriate tracking can be retrieved.

- Requests for retrieval are intended to be prompt, but may take significant time due to logistical or staffing limitations, and are subject to operational limits and legal constraints, as well as security considerations.

This process is not intended to facilitate the retrieval of pennies for the purpose of withdrawal, since the terms of service require the pennies to be on permanent deposit and do not allow for redemption of the deposited pennies.

4. Treasury Management

The physical pennies themselves do not yield interest. They may serve as a base collateral pool that enables PennyDAO to hold conservative no-risk financial assets, depending on strict regulatory conditions and approval.

5. Tokenomic Setup: Sinks, Faucets, and Utility

5.1. Faucets (Supply): How Penny tokens enter circulation

The supply of Penny tokens will be minted and issued by the DAO in accordance with the consensus rules, this can be considered the “faucet”. The faucet side is strictly controlled by policy and verifiable inventory.

- **Direct deposit** - Users send in physical pennies for deposit. Penny tokens will then be minted and issued directly to depositors of physical pennies.
- **DAO Initiated Public Sale (DIPS)** - In the event that Penny tokens are burnt, the DAO may reissue penny tokens and sell them on the open market, so long as the physical backing remains intact.
- **Partnerships** - curated programs where trusted partners collect pennies at scale from users, on behalf of the DAO.
- In addition to the Penny token, additional stable tokens may be issued by the DAO for the metal value of the physical pennies and sold on the open market.
- In the event that rare or particularly valuable pennies are deposited, an additional NFT may be issued by the DAO for the numismatic value of the physical pennies and sold on the open market.

5.2. Sinks (Demand): How Penny tokens are removed or locked

The DAO will also act to maximize the demand for the tokens, this can be considered the “sink”. The objective is to balance supply and demand in a way that keeps the peg relationship stable and drives organic demand, by creating non-speculative uses for the token. Various different incentive

mechanisms will be developed in order to maximize demand for the Penny token. These incentive structures may be developed by the DAO itself, or other third parties may develop their own mechanisms in order to earn Penny tokens while adding value to the PennyDAO ecosystem.

- **Burns in the Pennyverse** - The primary reference implementation for an incentive structure developed by the PennyDAO will be the “Pennyverse”, a metaverse environment where everything is made from stacks of pennies.
 - Empty space in the Pennyverse will be free or very cheap. The idea is to maximize the amount of participants within the space.
 - Anything that is built in the Pennyverse must be constructed with stacks of pennies. In order to place a penny in the Pennyverse for construction, a Penny token must be burnt.
 - This incentivizes users to burn their tokens, which allows the DAO to obtain revenue by reissuing burnt tokens onto the open market.
 - Ideally, the demand for tokens will be greater than the availability, which will organically drive up the price of the token on the open market.
 - Third parties will be able to burn tokens to build establishments within the Pennyverse such as arcades, museums / galleries, stores, etc... They will be able to earn Penny tokens from users in the Pennyverse that spend tokens in their establishments.
 - This potential for revenue will incentivize would-be builders to create more establishments, which will further drive up the demand for tokens which are needed for building in the Pennyverse.
- **DAO fees** - certain governance or service fees may be denominated in Penny tokens and burnt partially or fully
- **Third party integrations** - external apps can design mechanics that lock or burn Penny tokens in exchange for goods or services.

6. The Pennyverse and Real World Layer

In order to support and promote the Ecosystem, PennyDAO will create and maintain the Pennyverse environment, as well as various real-world activations such as public art installations or other attractions. The central penny repository will also be open to the public for inspection, and there will be various interesting activities there to actually drive traffic to the location.

- Pennyverse environment where everything is built from stacks of pennies:
 - **Empty Space** - Obtaining space in the Pennyverse should be either free or extremely cheap. The idea is to maximize

- participation. The “cost” shows up when users want to build or modify within their space.
- **In world construction** - Building structures, experiences, or establishing “borders” around certain “virtual land” may require burning Penny tokens.
 - **Third party establishments** - Builders burn Penny tokens to create shops, games, or venues that they can use to accept Penny tokens from users, thus increasing demand for the Penny tokens.
 - **Partnerships** - Pennyverse implementation details are intentionally open. PennyDAO expects to partner with experienced game, AR/XR, and world building teams to execute.
- **Real-World Presence and Infrastructure:**
 - **Vault Facility** - The facility where physical pennies are to be received, processed, stored, and displayed to the public will be referred to as “The Vault”. It will be established in a prominent and conspicuous location, such that the general public may be encouraged to visit and participate within the PennyDAO Ecosystem. Appropriate security measures will be implemented as well, to protect the facility and the deposits inside.
 - **IRL activations** - statues, fountains, and art pieces themed around pennies, using either actual pennies from the DAO (where safe) or penny-like plastic elements to protect Vault integrity.
 - **AR / XR overlays** - mixed reality experiences that map pennies and Pennyverse elements onto real world locations
 - **Edutainment** - Educational and entertaining programming, pertaining to historical events or people that are related to pennies

7. Technology Stack

7.1. Chains and Token Standards

PennyDAO is designed to be chain agnostic, but will be implemented to utilize UTXO based logic. Initial deployment of the core PennyDAO functionality will be done on the Bitcoin Blockchain, using the Counterparty L2 protocol. Using Counterparty Protocol will also allow the Penny tokens to be traded freely and in a permissionless manner on the established and highly secure Counterparty DEX. This will absolve the PennyDAO from needing to implement its own DEX solution, which has significant potential for security breaches or crashes.

For certain aspects of PennyDAO functions that require higher volumes of transactions to implement logic operations (such as for the pennyverse

implementation), the Dogecoin Blockchain may be used in order to take advantage of the cheap transaction fees and fast block times, while also remaining within the Bitcoin ecosystem. Most likely the Dogeparty L2 protocol will be used for this, in order to take advantage of the development for Counterparty on Bitcoin. However, other protocols are open for consideration.

For multi-chain implementations, tokens may be moved from one chain to another as necessary using a variety of methods including but not limited to atomic swaps or manual transfers. For an atomic swap, both chains must be compatible with such a transfer. With manual transfers, an authorized PennyDAO steward would manually delete or burn the tokens from the original chain, and then manually create the corresponding number of tokens onto the destination chain. Other methods may be implemented as needed.

The whitepaper intentionally avoids committing to a single chain until regulatory, technical, and ecosystem factors are fully evaluated.

7.2. Internal Systems

Key components:

- **Intake and Tracking System** - Maps physical pennies to batches, inventory, and on-chain records
- **Minting Controller** - Enforces the 1:1 relationship between physical pennies and Penny tokens, as well as the fungible metal backed tokens
- **NFT Registry** - Manages Numismatic NFTs and their metadata
- **Treasury Management Tooling** - interfaces with authorized stewards, and tracks inventory of pennies or other PennyDAO assets
- **Audit and Reporting Pipeline** - produces public reports on supply/demand, serialized and unserialized inventories, reserves, and any other major changes

7.3. Open Source and Audits

PennyDAO intends to open source critical on-chain components and publish regular third party audits where applicable and practical.

Given that PennyDAO functions as an entity managing real world collateral at scale, some internal tools and processes may remain proprietary for security reasons when necessary. However, the default bias is toward transparency. Especially when dealing with supply, collateral composition, governance decisions, and major Pennyverse mechanics.

Third party auditors, bug bounty programs, and other open source related decisions will be announced as is needed during the development process.

8. Governance and the DAO

8.1. Legal Wrapper

PennyDAO will be lawfully registered as a Wyoming DAO LLC or similar entity.

- Provides a recognized legal home for vault contracts and service relationships
- Clarifies limited liability and compliance responsibilities
- Bridges on-chain governance with offchain obligations

8.2. Governance Model

Governance is designed to combine token based input, NFT based nuance, and oversight from a human council to maintain security and functionality.

High level:

- A dedicated non-transferable non-speculative governance token and certain NFTs participate in voting
- Voting follows a “1 token 1 vote, with diminishing returns” pattern - large holders get influence but not absolute dominance
- A DAO council of KYC verified participants and stewards handle day-to-day operations under the DAO’s oversight
- A DAO council may be set up where members are voted in via a process that also applies diminishing returns and requires verified addresses.

8.3. Voting and Execution

The voting structure aims to remain tamper resistant while still being flexible enough to adapt to evolving regulations.

Governance votes may be subject to a release delay - for example, a vote might pass, then queue for a period before execution to allow for safety checks and regulatory considerations.

- **Voting** - snapshot style system, with votes signed by verified addresses.
- **Execution** - on-chain via a multisig controlled by council members and key stakeholders. Alternatively, with a Counterparty Protocol based implementation, the “Announcement” feature may be used as well.

- **Eligibility** - addresses used by council and core voters are typically ones PennyDAO has interacted with and KYC'd, especially for higher impact actions. For non-KYC votes, an eligibility token of some sort may be used to indicate which addresses are eligible to vote.

8.4. Guardrails and Limits

PennyDAO governance is explicitly constrained by guardrails designed to protect users and the peg.

Examples:

- Caps on how much of reserves can be placed into non core pockets
- Restrictions on self dealing or high risk counterparties
- Limits on how quickly reserve composition can change
- Conservative policies around scholarships, grants, and growth funds to prevent emotional swings from harming solvency

9. Regulatory and Risk Considerations

9.1. Not a Bank, No Insured Deposits

PennyDAO is not a bank, credit union, or insured depository institution. Penny tokens are not insured by the FDIC, SIPC, or any government program. Holding Penny tokens or NFTs exposes the holder to various risks, including the risk of total loss. PennyDAO is not liable or responsible for any loss.

9.2. No Promise of Profit or Guaranteed Redemption

Penny tokens are designed as a stable medium of exchange and unit of account, not as an investment promising profit. There is no guarantee of redemption at par into fiat currency. Any best effort processes for retrieving specific pennies are operational services, not contractual rights. Users should not acquire Penny tokens based on an expectation of profit derived from the efforts of PennyDAO or any third party.

9.3. Major Risk Categories

Non exhaustive list:

- **Custodial risk** - theft, fraud, or failures at vault providers
- **Market risk** - peg deviations on exchanges, liquidity shocks, or loss of confidence
- **Legal and regulatory risk** - changes in laws that restrict operations or access in some jurisdictions

- **Operational risk** - errors in counting, tracking, minting, or issuance that affect supply
- **Smart contract risk** - bugs or exploits in on-chain contracts
- **Numismatic valuation risk** - appraisal errors or changes in collector markets
- **Financial Risk** - operational costs, capital constraints, and sustainability concerns; not a financial investment
- **Speculation Risk** - secondary market trading unrelated to utility by third parties outside the control of PennyDAO, hype cycles, crypto sentiment drift
- **Real Estate Risk** - lease termination, zoning, condemnation, loss of facility access
- **Vehicle Risk** - accidents or mechanical failures damaging assets in transit
- **Transportation Risk** - loss, theft, damage, or delay during physical coin movement
- **Material Damages Risk** - fire, water, corrosion, equipment failure affecting stored coins
- **Theft Risk** - physical vault breach and digital private key or insider compromise
- **Fraud Risk** - misrepresented counts, excess minting, fabricated appraisals, social engineering
- **War Risk** - armed conflict or geopolitical instability disrupting operations
- **Flooding Risk** - coastal/low-elevation facility vulnerability; specifically notes hurricane-prone regions
- **Miami Bullshit Risk** - hype-driven distortion from crypto culture concentration
- **Municipal Risk** - zoning, permits, code enforcement, eminent domain
- **Regulatory Risk** - SEC/CFTC/FinCEN enforcement under uncertain interpretive frameworks
- **IRS Risk** - tax complexity, reporting obligations, users solely responsible

10. Roadmap

The following is an approximate and non-binding suggested roadmap for the overall development of the PennyDAO Ecosystem:

- **Phase 0 - Research and structuring**
 - Publish Whitepaper
 - Finalize legal entity and jurisdiction
 - Choose initial chain and token standards
 - Define vault relationships and intake logistics

- **Phase 1 - Core stablecoin launch**
 - Launch Penny token with 1:1 backing in physical pennies
 - Stand up basic intake and documentation pipeline
 - Publish simple reserve and supply reporting
- **Phase 2 - Metallic Value and Numismatic NFTs**
 - Deploy Metallic Value token and Numismatic NFT systems
 - Start appraisals and basic numismatic flows
 - Explore loan and auction pilots with trusted partners
- **Phase 3 - Pennyverse and IRL expansion**
 - Pilot virtual Pennyverse experiences
 - Launch initial IRL installations and event presence
 - Integrate Penny tokens into third party apps and communities
- **Phase 4 - Scaling and multi chain**
 - Expand to additional chains and bridges
 - Grow reserves, intake capacity, and geographic footprint
 - Deepen governance, audits, and transparency

Timelines and ordering may change as funding, regulation, and partnerships evolve.

11. Disclaimers

This document is a technical and conceptual overview of the PennyDAO project. It is:

- Not an offer to sell or a solicitation of an offer to buy any security, commodity, or financial instrument
- Not investment advice, legal advice, or tax advice
- Subject to change as laws, regulations, and market conditions evolve
- Any launch of tokens, entities, or services will be subject to additional documentation, terms, and compliance measures.