

The Coherence Economy: A Complete Green Paper

Redefining Value Through Measurable Alignment

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Abstract

Modern economies optimize for extraction and accumulation, creating systemic incentives that reward noise over signal, transaction volume over genuine value creation, and short-term gains over long-term flourishing. This green paper proposes **The Coherence Economy**—a new economic paradigm where value generation is measured by alignment rather than extraction, implemented through decentralized infrastructure that makes coherence measurable, verifiable, and compensable.

We introduce **Proof of Coherence (PoC)**, a novel consensus mechanism that replaces energy-burning (PoW) and capital-hoarding (PoS) with verified contributions to collective clarity, reduced entropy, knowledge sharing, and sustainable coordination. Through a dual-token architecture combining non-transferable reputation (**Soulbound Tokens**) with liquid value exchange (**Aurum**), we create an economic system where your ability to generate prosperity is proportional to your demonstrated capacity to increase coherence.

This is not utopian philosophy—it is **incentive engineering**. The question is no longer "could this work?" but rather "what happens when the first network implements it?"

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1. Problem Statement

1.1 The Misalignment Crisis

Contemporary economic systems suffer from a fundamental misalignment between value creation and value capture.

What Creates Value (unpaid or underpaid):

- Teaching and mentorship
- Emotional labor and caregiving
- Conflict resolution and mediation
- Open-source development
- Scientific research sharing
- Environmental regeneration
- Meaningful conversation and artistic insight

What Captures Value (highly compensated):

- Attention extraction and algorithmic manipulation
- Rent-seeking and regulatory capture

- Financial speculation divorced from productive activity
- Planned obsolescence and waste generation
- Information asymmetry exploitation

The result is a civilization that financially rewards the destruction of coherence (entropy generation) while leaving coherence-generating activities as externalities.

1.2 The Measurement Gap

Traditional economics measures **flow** (GDP, transaction volume) but not **direction**. Money measures magnitude without vector. We can quantify how much money moved, but not whether life improved or clarity increased.

1.3 Why Previous Solutions Failed

- **UBI**: Provides survival but not purpose.
 - **CSR**: Voluntary, unenforceable, and often performative.
 - **Web2 Reputation**: Gameable, siloed, and disconnected from economic settlement.
 - **Existing Crypto**: Optimizes for capital accumulation (PoS) or energy waste (PoW), perpetuating extractive incentives.
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2. Core Thesis

If coherence can be measured, coherence should be the currency.

2.1 Defining Coherence

Coherence is not just "good vibes"; it is a measurable reduction in entropy across scales:

- **Individual**: HRV, nervous system regulation, behavioral alignment.
- **Interpersonal**: Signal-to-noise ratio in communication, friction reduction.
- **Collective**: Information flow efficiency, knowledge graph connectivity.

- **Environmental:** Regenerative resource patterns.

2.2 The Coherence Equation

Coherence is formalized as entropy reduction over time:

$$C(t) = -\frac{\Delta S}{\Delta t} + \sum_i (A_i(t) \times M_i)$$

Where:

- $C(t)$: Coherence score at time t
- ΔS : Change in system entropy
- $A_i(t)$: Individual contribution i
- M_i : Multiplier based on network propagation

2.3 The Shift

When generating coherence becomes the most profitable activity, the entire trajectory of civilization shifts from "How do I extract value?" to "How do I generate alignment?"

3. Philosophical Foundation

3.1 Non-Extractive Economics

The Coherence Economy treats meaning, knowledge, and emotional attunement as **non-rival goods**.

- **Extractive Model:** I share insight → I lose proprietary advantage.
- **Coherence Model:** I share insight → Knowledge graph connectivity increases → My coherence score (and earning potential) rises.

3.2 Universal Basic Meaning (UBM)

Unlike UBM (Income), UBM (Meaning) provides income proportional to contribution. It offers built-in dignity (no gatekeepers) and a sustainable trajectory where increased capacity leads to increased value generation.

4. Technical Architecture

4.1 Why Web3 Is Required

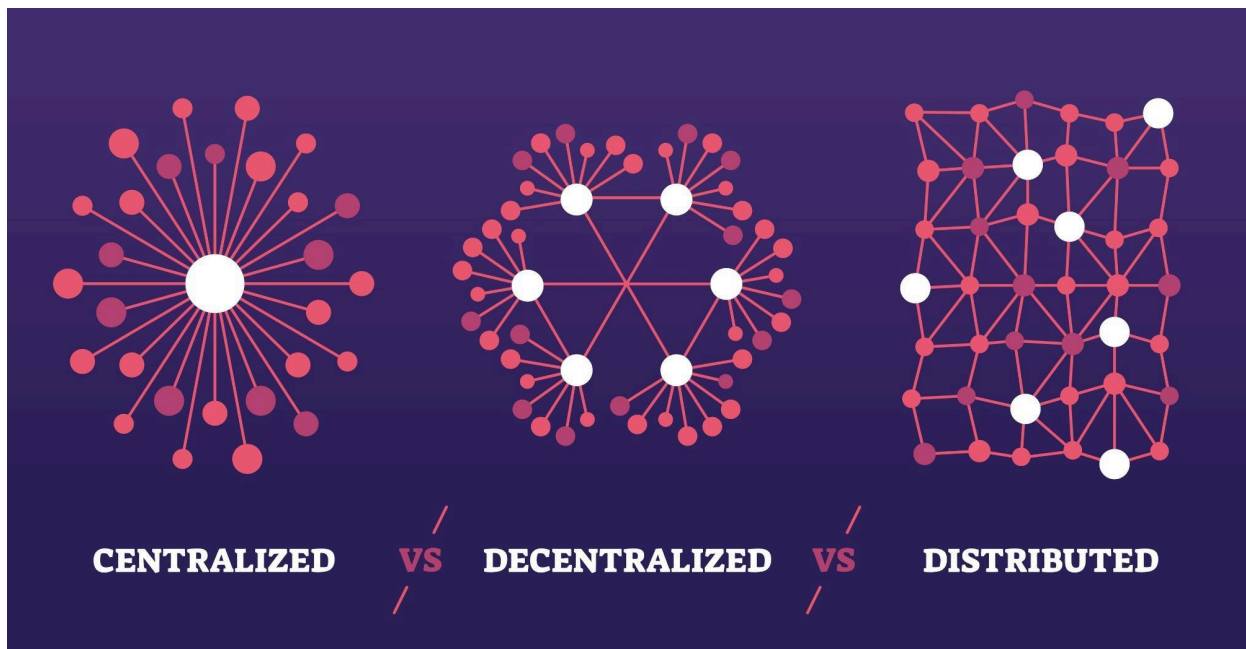
Centralized control creates single points of corruption and surveillance incentives. Web3 provides trustless verification, censorship resistance, and automated settlement.

4.2 The Full Stack

Layer	Technology	Purpose
Settlement	Ethereum L2 (Optimism/Arbitrum)	Immutable ledger of coherence events
Identity	DIDs (Decentralized Identifiers)	Self-sovereign reputation portability
Reputation	Soulbound Tokens (ERC-5192)	Non-transferable coherence history
Privacy	zk-SNARKs / zk-STARKs	Prove coherence without revealing details

Oracles	Chainlink + Custom PoC Oracles	Bridge off-chain coherence data on-chain
Sensors	DePIN (IoT, Wearables)	Measure physical coherence signals
Exchange	ERC-20 (Aurum Token)	Liquid value transfer medium

4.3 Data Flow Architecture



1. **Physical Reality:** HRV, Conversation, Environmental data.
2. **DePIN Sensors:** Capture signals via IoT/Wearables.
3. **TEE Processing:** Encrypted local computation.
4. **zk-Proof Generation:** Privacy-preserving attestation.
5. **Oracle Network:** Aggregate multi-source verification.
6. **Smart Contract:** Proof of Coherence validation.
7. **Settlement:** Minting of SBT (Reputation) + AU (Value).

5. The Oracle Problem: Measuring Coherence

How do we verify "goodness" without a central authority? By using **Multi-Modal Attestation**. No single source is trusted; truth emerges from convergent evidence.

5.1 Verification Modes

- **A. Biometric Oracles:** Wearables measure HRV and stress markers. Data is signed locally; only proofs are sent on-chain.
- **B. Social Graph Oracles:** Peer endorsements, conflict resolution verification, and witness signatures.
- **C. Informational Oracles:** Citation graphs, GitHub commits, dependency trees.
- **D. Environmental Oracles:** Air quality sensors, soil health monitors, satellite data.
- **E. Entropy Reduction (Zn):** Algorithms that measure system-wide entropy reduction using PageRank-style logic for influence.

5.2 Privacy via Zero-Knowledge (zk-SNARKs)

We must verify coherence without surveillance.

- *Example:* Prove "I mediated a dispute" without revealing *who* fought or *what* it was about.
 - *Mechanism:* Circuits prove statistical properties without exposing raw data.
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6. Dual-Token Model

6.1 The Split

We separate **Signal** (Reputation) from **Resource** (Money) to prevent plutocracy.

6.2 Token A: Coherence Soulbound Token (SBT)

- **Type:** ERC-5192 (Non-Transferable).
- **Function:** Represents **Capacity**.
- **Dynamics:** Accumulates through verified acts. Decays over time (half-life ~2 years) to prevent resting on laurels.
- **Utility:** Governance weight, oracle participation, multiplier for AU minting.

6.3 Token B: Aurum (AU)

- **Type:** ERC-20 (Liquid).
 - **Function:** Represents **Energy/Exchange**.
 - **Minting:** $\$AU = k \times (SBT)^\alpha \times (\Delta C)^\beta$
 - **Utility:** Medium of exchange, staking, purchasing services.
 - **Burn Mechanism:** Burned when entropy-generating actions are detected or as transaction fees.
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7. Proof of Coherence (PoC) Consensus

7.1 The Mechanism

PoC replaces energy waste (PoW) and capital hoarding (PoS) with verified entropy reduction.

7.2 Validation Steps

1. **Event:** Alice teaches Bob (skill transfer).
2. **Attestation:** Bob signs "I learned X", Biometrics show stress reduction, Social graph updates.
3. **zk-Proof:** Generated to protect privacy.
4. **Consensus:** Oracles aggregate proofs; if > threshold agree, event is valid.
5. **Settlement:** Smart contract updates Alice's SBT and mints AU.

7.3 Social Slashing

If Alice is found to be a bad actor later, the community can vote (quadratically) to retroactively slash her SBT and claw back AU, preventing long-term gaming.

8. Smart Contract Primitives

- **Coherence Circles:** Small groups (Dunbar number aligned) for mutual accountability.
 - **Conflict Resolution:** Staked disputes where resolution rewards the mediator and parties, but sustained conflict burns the stake.
 - **Retroactive Public Goods Funding:** Dependency graphs automatically route value to foundational contributors years after the work is done.
 - **Meeting Efficiency:** Participants stake AU to attend; if the meeting is deemed "wasteful" by vote, stakes are burned.
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9. DePIN Infrastructure Layer

Decentralized Physical Infrastructure Networks anchor the economy in physical reality.

- **Biometric:** Open-source HRV/EEG monitors.
 - **Compute:** Edge nodes with TEEs (Trusted Execution Environments) to process privacy-preserving proofs.
 - **Environmental:** Soil and air sensors linked to carbon-credit smart contracts.
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10. Governance & Evolution

10.1 The Governance Paradox

We cannot hardcode "coherence" forever, nor can we leave it fully open to mob rule.

10.2 Architecture

- **Layer 1 (Constitutional):** Immutable principles (Non-transferable SBT, Privacy rights). Change requires 90% consensus + 2-year delay.
- **Layer 2 (Parameters):** DAO governable (Minting rates, Oracle weights).
- **Layer 3 (Implementation):** Rapid iteration by working groups.

10.3 Quadratic Voting

Vote power is the square root of SBT ($V = \sqrt{SBT}$). This prevents whales from dominating and rewards broad consensus over deep pockets.

10.4 Coherence Categories & Taxonomies

(Continued from draft)

The system recognizes distinct types of coherence to ensure diverse contributions are valued:

- **Educational Coherence:**
 - *Metrics:* Knowledge transfer verification, skill acquisition rates, mentorship longevity.
 - *Oracle:* Academic citations, GitHub dependencies, peer attestations.
 - **Social Coherence:**
 - *Metrics:* Conflict resolution, community weaving, emotional support.
 - *Oracle:* Dispute resolution contracts, reputation-weighted testimonials.
 - **Ecological Coherence:**
 - *Metrics:* Carbon sequestration, biodiversity increase, waste reduction.
 - *Oracle:* IoT sensors, satellite imagery analysis.
 - **Technical Coherence:**
 - *Metrics:* Code efficiency, bug fixes, system stability (uptime).
 - *Oracle:* Automated code audits, performance monitoring.
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11. Economic Modeling & Attack Vectors

11.1 Supply Dynamics

- **Elastic Supply:** AU supply is not fixed (like Bitcoin) but **elastic based on coherence**.
- **Inflation/Deflation:**
 - If the world becomes *more* coherent, money supply expands to facilitate new value.
 - If the world becomes *less* coherent (war, destruction), money supply contracts (burns), creating immediate financial pressure to resolve conflict.
 - *Formula:* $\Delta M = k(\Delta C_{\text{global}})\$$. Money tracks the health of the system.

11.2 Attack Vectors & Mitigations

Attack Vector	Description	Mitigation Strategy
Sybil Attack	Creating fake accounts to farm AU.	SBT Gating: New accounts have 0 SBT and low minting power. Building SBT requires verified, high-effort inputs (biometric, peer) that are hard to automate.
Oracle Collusion	Validators lying to mint fake tokens.	Staking & Slashing: Validators stake massive AU. If statistical analysis detects outliers or fraud, the stake is burned.
The "Popularity Contest"	Charismatic narcissists gaming the social graph.	Multi-Modal Requirement: Social popularity alone isn't enough. Must be backed by objective data (biometric, environmental, output) to reach high tiers.

Privacy Leaks	Deanonymization of user data.	Client-Side ZK: Raw data never leaves the user's device. Only mathematical proofs are transmitted.
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12. Implementation Roadmap

Phase 0: The Whiteboard (Current)

- Finalize mathematical models for Coherence Equation.
- Publish Green Paper for academic and developer review.
- Simulate tokenomics in CADCAD.

Phase 1: The Testnet (Coherence V1)

- **Target:** Closed beta for 500 users (a "Coherence Village").
- **Feature Set:** Basic SBT implementation, Manual Peer Attestation, Simple Conflict Resolution contracts.
- **Goal:** Calibrate the "Social Graph" weightings and test UI/UX.

Phase 2: The Infrastructure (DePIN Integration)

- Launch Oracle Nodes for HRV and GitHub integration.
- Release "Coherence SDK" for third-party app integration.
- **Genesis Block:** Minting of the first AU tokens based on Phase 1 retroactive activity.

Phase 3: The Economy (Public Launch)

- Full DAO governance activation.
- Listing of AU on DEXs (Exchangeability enabled).
- Deployment of "Coherence Grants" for ecosystem developers.

Phase 4: The Civilization (Global Scaling)

- Integration with municipal governments for civic coherence.
 - Corporate adoption for internal HR and productivity measurement.
 - Standardization of "Proof of Coherence" as an ISO-equivalent metric.
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13. Conclusion

We are currently playing a game where the rules are set to destroy the board. As long as money is created through debt and extraction, human behavior will bend toward exhaustion and conflict.

The Coherence Economy is not a request for people to be "better." It is a recognition that people respond to incentives. By changing the underlying physics of value creation—making the generation of clarity, peace, and sustainability the most *rationaly profitable* action a human can take—we do not just solve economic problems. We solve coordination failure itself.

The technology is ready. The math is sound. The only remaining variable is our courage to migrate.

Join the network.

Verify Alignment. Mint Value. Reduce Entropy.