Protocol Logic

The Calyx Protocol is designed to convert independently verified data into durable, transferable digital proof. Unlike ratings or scores that rely on interpretation, Calyx produces **Blockchain Units of Derived Signal (BUDS)** — tokens that embody trust, mathematically derived from confirmed facts.

1. Core Principles

- **Verifier-Centric** – Proof begins at the origin, with accredited verifiers minting tokens directly from their confirmations.

- **Math-Certified** – Scoring is governed by transparent formulas (Calyx Arc™ and Compound Matrix™), not by hidden models.

- **Enduring** – Each BUDS token retains its validity over time, consultable at any moment.

- **Composable** – Proof can be compounded within entities (intra-entity) and propagated across entities (inter-entity).

- **On-Chain** – All issuance events are anchored on-chain, ensuring immutability and universal auditability.

2. The Calyx Arc™: Single Verification

Each verified fact (e.g., "Company A reduced electricity use by 5% in 2025") is minted into **BUDS** according to the Arc formula. The Arc governs:

- **Issuance at T_0** – A baseline number of BUDS are minted when the verifier confirms the fact.

- **Time Behavior** – Signals decay slightly over time if not reinforced, ensuring relevance while maintaining continuity.

- **Auditability** – Each Arc instance remains consultable forever, with proof of who verified, when, and under what context.

3. The Compound Matrix™: Alignment & Compounding

When multiple verifications align, they **compound non-linearly** into stronger proof.

- **Intra-Entity Compounding** – Verifications within one company (e.g., energy, emissions, water) amplify each other.

- **Inter-Entity Compounding** – When actions connect across organizations (e.g., supplier + buyer alignment), tokens issued to each party increase proportionally.

- **Non-Linearity** – The formula is exponential rather than additive: aligned actions don't just add value, they multiply it.

4. BUDS Tokenization

- **Definition** – BUDS are **Blockchain Units of Derived Signal**.

- **Nature** – They are not a currency or a financial asset, but cryptographic records of verified trust.

- **Distribution** – Issued to both the entity being verified and the verifier who confirmed it, ensuring aligned incentives.

- **Persistence** – Once minted, BUDS remain on-chain as auditable, transferable proof.

5. Propagation & the Attribution Ledger

Proof can propagate when transferred between entities (e.g., from supplier to buyer to investor). The **Inter-Entity Attribution Ledger** ensures:

- **Lineage** – Every transfer records the origin of proof.

- **No Double Counting** – A verification can propagate, but cannot be claimed twice.

- **Traceability** – Any stakeholder can audit the full path of a verification through the ecosystem.

6. Example Walkthrough

1. Verifier confirms that **Supplier A reduced emissions** → 100 BUDS minted.

2. Verifier confirms that **Buyer B purchased from Supplier A** → Matrix compounds → 150 BUDS each.

3. Investor verifies that **Buyer B's portfolio meets criteria** → Proof propagates → 200 BUDS attributed, with lineage traceable to Supplier A.

7. Why This Logic Matters

Traditional ESG scores are subjective and inconsistent across frameworks. Calyx replaces them with:

- A **verifier-first process**

- A **transparent, mathematical standard**

- A **durable signal** that compounds and propagates

This makes Calyx not a rating service, but a **protocol for proof**.