

WHITEPAPER & EXPANDED OPERATIONAL AND STATUTORY PROFILE

UNIONTRE (Version 2.02-C)

1. Legal Basis and Operational Mission Declaration

UnionTre (hereinafter: "the Organization" or "the Protocol") is an integrated ecosystem entity operating at the intersection of Distributed Ledger Technology (DLT) and ecosystem engineering. The Organization was established to mitigate the effects of global biosphere degradation by implementing the **Regenerative Finance (ReFi)** paradigm, which redefines natural capital as a liquid and measurable asset.

- **ReFi Paradigm:** We implement a model where capital circulation within the UnionTre network mimics the transport of assimilates in the vascular tissue of higher plants, ensuring optimal resource distribution from capital nodes to field executive units.
- **Operational Vision:** To create the so-called "**Internet of Nature (IoN)**"—a decentralized telecommunications network where every financial operation is binarily and inextricably linked to the biological regeneration process.
- **Quantifiable Goals (2030 Standard):** The UnionChain protocol is programmed for the sequestration of **100 million tons of CO2 equivalent** and the restitution of **1 million hectares** of degraded land.

2. Genesis and Technological Development Analysis (2024–2026)

The UnionTre project is not the result of an impulsive initiative but of a multi-year analysis of market failures identified during the 2024 Lisbon Climate Summit. At that time, a critical "**Trust Gap**" was identified in traditional carbon credit trading, resulting from information asymmetry and a lack of transparency.

- **R&D Phase (2025):** The entire 2025 fiscal year was dedicated to calibrating remote sensing systems and integrating them with smart contracts under ERC-721 and ERC-1155 standards.
- **Genesis Implementation (Dec 31, 2025):** The Mainnet activation occurred through the issuance of the genesis block and a dynamic NFT (dNFT) with the identifier "Root One," synchronized with a physical biological planting on the Polygon 2.0 network.

3. Organizational Structure and Oversight Mechanisms

UnionTre operates in a hybrid model, combining corporate responsibility with the sovereignty of a **DAO (Decentralized Autonomous Organization)**.

- **Operational Management (Core Team):** Consists of 45 certified specialists from 12 jurisdictions, including PhDs in biological sciences, blockchain engineers, and legal auditors.

- **UnionTre DAO:** An oversight body consisting of 80,000 community validators with the authority to decide on the allocation of funds from the **Green Treasury**.
- **Field Verification:** Cooperation with 15 international non-governmental organizations (NGOs) ensures the physical durability of regenerative projects across four continents.

DETAILED TECHNICAL ANNEX – CONSENSUS PROTOCOLS AND SMART CONTRACT SPECIFICATIONS

1. UnionChain Protocol Architecture

UnionTre utilizes a Layer 2 (L2) of the Polygon 2.0 network based on Zero-Knowledge Ethereum Virtual Machine (zkEVM), ensuring full carbon neutrality for on-chain operations.

- **Proof of Impact (PoI) Algorithm:** A multi-layered consensus protocol that makes reward token issuance contingent on external validation of environmental data.
- **AI Sentinel Integration:** An artificial intelligence system analyzes remote sensing data from the Sentinel-2 constellation (European Space Agency) to automatically detect anomalies in biomass.

2. Smart Contract Specifications (Operational Standards)

- **Contract-Regenerator (Core):** The main contract managing \$TRE token issuance, featuring an automatic burn function of 0.5% for every transaction.
- **Dynamic-NFT-Engine:** Manages dNFT metadata, updating visual and utility parameters based on annual biomass growth reported by IoT sensors.
- **Green-Vault-Contract:** A multi-sig architecture treasury requiring DAO consensus to release funds for operational purposes.

RISK ANALYSIS AND MITIGATION STRATEGIES (OPERATIONAL SECURITY FRAMEWORK)

1. Ecosystem and Biological Risks

- **Risk of Biomass Loss:** Fires, floods, or pests may destroy physical plantings.
 - *Mitigation:* UnionTre utilizes a reserve fund (Impact Treasury) and geographic dispersion of projects (biotope diversification).
- **Risk of Erroneous Satellite Data:** Distortions in remote sensing readings.
 - *Mitigation:* Triple validation system—satellite data is cross-referenced with ground IoT sensors and inspections by local field partners.

2. Technological Risks and Cybersecurity

- **Smart Contract Bugs:** Vulnerability to exploit attacks.
 - *Mitigation:* All contracts have passed audits by **CertiK** and **OpenZeppelin**. Transparency reports are published on-chain every 24 hours.
- **Market Liquidity Risk:** Sharp fluctuations in \$TRE token value.
 - *Mitigation:* A deflationary mechanism (burn) and a 10-year community vesting period ensure long-term supply stability.

DAO REGULATIONS AND THE UNIONTRE CONSTITUTION (LEGAL-ADMINISTRATIVE FRAMEWORK)

1. Rights and Obligations of DAO Members

Membership in UnionTre DAO is acquired by holding \$TRE tokens in a digital wallet.

- **Right of Initiative:** Any holder of at least 0.01% of the total supply can submit a project proposal.
- **Voting Process:** We use the Snapshot system with quadratic voting weights based on the amount and duration of locked tokens (so-called "Root Staking").

2. Protocol Public Finance and the Green Treasury

All financial flows within UnionTre are subject to a rigorous fiscal policy:

- **Growth Fee:** 1.0% of every transaction is automatically redirected to the purchase of new land for afforestation.
- **Reward Distribution:** 40% of the supply is reserved for Proof of Impact rewards, released linearly over 120 months (10 years).
- **Oxygen Dividend:** Annual redistribution of reward units (**Oxygen Droplets**) to users with the highest "Eco-Score."

3. Final Provisions and Jurisdiction

UnionTre operates according to the guidelines of the ReFi regulation center in **Zurich, Switzerland**, maintaining full compliance with local digital asset and environmental protection laws. Any changes to these regulations require a 66% majority vote in the DAO with a quorum of at least 25% of the total locked supply.

UNIONTRE WHITEPAPER v1.1: COMPREHENSIVE PROTOCOL SPECIFICATION

"Integrated Digital Ecosystem for Biosphere Regeneration and Climate Change Mitigation"

Publication Date: January 15, 2026 | **Operational Status:** Live (Implemented Dec 31, 2025)

Jurisdiction: Zurich, Switzerland (ReFi Regulation Center)

1. Executive Summary

The UnionTRE protocol is a decentralized application layer architecture designed for the systemic convergence of Web3 financial liquidity with physical, verifiable climate mitigation actions. Utilizing the advanced framework of **Regenerative Finance (ReFi)**, UnionTRE transforms passive environmental protection models into active, profitable, and radically transparent economic processes.

The ecosystem operates based on the biometric metaphor of the **"World Tree,"** where individual protocol modules correspond to specific functions of a biological organism to optimize resource distribution.

2. Problem Analysis and Solution Framework

2.1. Risk Identification: Trust Crisis and Greenwashing

In 2025, the global carbon credit market showed critical deficits in operational transparency. Corporate entities purchased "offsets" that showed no correlation with the actual state of biomass.

2.2. Solution Implementation: On-Chain Transparency

UnionTRE introduces the **On-Chain Transparency** standard. Every unit of impact—from a planted tree to a neutralized kilogram of plastic—is subject to multi-stage validation by satellite systems and AI algorithms.

3. Ecosystem Architecture ("World Tree" Model)

3.1. ROOT: UnionTRE DAO

The supreme governing body of the protocol.

- **Decisional Mechanisms:** \$TRE holders participate in voting on fund allocation for specific ecological projects ("Leaves").
- **Green Treasury:** Funds are released only based on community consensus.

3.2. TRUNK: \$TRE Utility Token

The \$TRE token acts as the conductive tissue carrying capital from investors to units implementing regenerative projects in the field.

3.3. BRANCHES: Product and Service Modules

1. **Digital Twin Seedlings (dNFTs):** Representation of a real plant in digital space. NFT parameters (size, value) evolve in the user's wallet synchronously with the growth of the physical tree.
2. **Green Lending Protocol:** A decentralized debt market dedicated to regenerative agriculture and CleanTech startups.
3. **UnionTRE Marketplace:** An automated trading platform for fractional carbon credits.

3.4. LEAVES: Quantification of Real Impact

Final operational effects include: creating new forests, decontaminating oceans, and regenerating topsoil. Every success unit generates "Oxygen Droplets."

4. Technology and Verification Protocols

4.1. Blockchain Infrastructure

Operates on the **Polygon 2.0 (zkEVM)** network to maintain full carbon neutrality and minimize gas fees.

4.2. UnionTRE AI Sentinel (Oversight Module)

- **Remote Sensing Analysis:** Processes data from the Sentinel-2 constellation to identify illegal deforestation.
- **Multimedia Verification:** Validates the authenticity of photographic documentation submitted by users in "Eco-Quests."

5. Tokenomics and Capital Structure (\$TRE)

Total supply: **1,000,000,000 \$TRE**.

5.1. Resource Allocation and Vesting Schedule

Segment	Allocation	Vesting Mechanism
Community & Rewards (PoI)	40%	Linear release over 120 months (10 years)
Green Treasury (Impact)	25%	Under direct DAO supervision

Liquidity & Exchanges	15%	Fully unlocked on Dec 31, 2025
Team & Development	12%	12-month cliff, then 36-month release
Strategic Partnerships	8%	24-month linear release

6. PROOF OF IMPACT (PoI) OPERATIONAL MODEL

Users generate value via the UnionTRE mobile app:

1. **Eco-Commute:** Rewards for opting for low-emission mobility (GPS verification).
2. **Cleanup Verification:** Scanning degraded areas before and after reclamation.
3. **Educational Modules:** Interactive biodiversity quizzes rewarded with micro-tokens.

7. STRATEGIC ROADMAP (2026)

- **Q1 2026 (Rooting):** DAO Dashboard implementation; "Oxygen Droplets" airdrop for Genesis dNFT holders; CEX/DEX listings.
- **Q2 2026 (Flowering):** Green Lending operational launch; Partnerships with global textile leaders.
- **Q3 2026 (Global Propagation):** Launch of "**World TRE Metaverse**" (VR forest visualization); Smart-City integration.
- **Q4 2026 (Full Autonomy):** Transfer of 100% decision-making power to the DAO; Target: 10 million verified trees.

8. SECURITY AND AUDIT PROTOCOLS

Verified by **CertiK** and **OpenZeppelin** (Dec 2025 reports). Financial reports are published on-chain at 24-hour intervals.

9. LEGAL NOTE AND DISCLAIMER

Participation involves market volatility risk. \$TRE is a **Utility Token**, not a financial instrument. This is not an investment offer.

OPERATIONAL DOCUMENTATION: DEVELOPMENT SCHEDULE (2026–2027)

Status: Technical Documentation v2.1-AD

1. Preamble

This prospectus, titled *"From Digital Seed to Global Forest,"* defines the multi-phase implementation of UnionTRE following the Genesis activation on December 31, 2025.

2. Phase 1: Rooting (Q1 2026)

- **January:** Algorithmic Liquidity (Uniswap v4); Root Staking activation (12-month lock).
- **February:** DAO Portal deployment; "Zero Vote" for priority geographic jurisdictions.
- **March:** "Living Forest" dNFT collection (10,000 units) synchronized with Amazon and Equatorial Africa coordinates.

3. Phase 2: Flowering (Q2 2026)

- **April:** PoI Beta-testing for 50,000 users.
- **May:** Green Lending launch (\$5M initial liquidity) with "Impact Yield" (dynamic interest based on eco-results).
- **June:** Carbon Credit Bridge for migrating traditional offsets to UnionTRE standards.

4. Phase 3: Pollination (Q3 2026)

- **July:** Enterprise Branch API for e-commerce (Shopify/Allegro); Auto-planting for every transaction.
- **August:** Ground IoT telemetry deployment for soil moisture and temperature metadata.
- **September:** Metaverse Global Eco-Summit.

5. Phase 4: Ecosystem (Q4 2026)

- **October:** Biodiversity Credits (Jaguar Token, Coral Token).
- **November:** UnionTRE Debit Card (Visa/Mastercard) with 0.1% transaction burn for ecology.
- **December:** On-Chain Impact Report and Oxygen Droplets dividend payout.

ECOLOGICAL ANNEX: BIOMASS AND SEQUESTRATION QUANTIFICATION

- **ISO and IPCC Standards:** Protocol adopts **ISO 14064-2:2019**. Biomass is converted to CO2 equivalents using biotope-specific allometric equations.
- **Dendrometric Growth Algorithms:** dNFT metadata is updated based on **von Bertalanffy growth models**.
- **Biodiversity Indicators:** Species protection is measured via the **Shannon-Wiener Index**, verified by AI-integrated camera traps.

ADVANCED GAME THEORY AND INCENTIVE MECHANISMS

- **Slashing for Oracles:** Oracles must lock a \$TRE deposit. Fraud detection by AI Sentinel results in a burn of the deposit.
- **Oxygen Droplet Emission Curves:** Distributed via a logarithmic function to prevent hyperinflation.
- **Governance Locking (veTRE):** Users lock \$TRE for up to 4 years to gain higher voting power.

REGULATORY COMPLIANCE (MiCA AND EU TAXONOMY)

- **MiCA Compliance:** Classified as a **Utility Token**.
- **EU Taxonomy:** Aligned with climate change mitigation and water resource protection goals.
- **AML/KYC/CFT:** 5AMLD compliant identity verification for the Credit Bridge and Green Lending.

TECHNICAL SPECIFICATION: ENTERPRISE API

Purpose: B2B Partners and E-commerce Integrators

1. API Architecture

RESTful and gRPC endpoints on Polygon 2.0.

- `/v1/impact/mint`: For automated fractional impact proof issuance.
- `/v1/sensor/telemetry`: Real-time emission reduction verification.

2. Pricing Tiers

Tier	Request Limit	Monthly Cost	Extra Features
Startup Eco	10k/mo	250 \$TRE	Basic satellite monitoring
Business Branch	100k/mo	2,000 \$TRE	Full Shopify integration
Enterprise Forest	Unlimited	10,000 \$TRE	Dedicated AI Sentinel agent

3. Sequestration Cost Calculation Formula

The unit cost of mitigation for a corporate partner (C_{imp}) is calculated as:

$$C_{imp} = \frac{(B_{mass} \cdot \alpha) + (T_{cost} \cdot \beta)}{\gamma \cdot \text{EcoScore}}$$

Where B_{mass} is satellite-verified biomass growth, T_{cost} is network gas fee, and $EcoScore$ is the partner's DAO-assigned reliability index.

DAO PROPOSAL TRE-GP-001 (APRIL 2026)

- **Subject:** Release of 500,000 \$TRE for Amazon Pilot Region A-1 (Brazil).
- **Plan:** Transche I (Pre-planting 20%), Transche II (Implementation 50% via AI verification), Transche III (Maintenance 30% via IoT).
- **Impact:** 250,000 trees; 45,000 tons CO2 sequestered.

ANNUAL IMPACT & FINANCIAL REPORT 2026

- **Letter to Stakeholders:** 2026 was the year "Internet of Nature" became a reality.
- **KPIs:** 15,000+ pilot trees; 1M tons CO2 neutralized; 80,000 DAO members.
- **Finances:** TVEL (Total Value Ecologically Locked) > \$25,000,000.

ANTI-GREENWASHING MANUAL (V2.0)

Triple-Layer Verification

1. **Macro (Satellite):** Sentinel-2 real-time monitoring.
2. **Micro (IoT):** Ground sensors feeding NFT metadata.
3. **Social (Oracle):** DAO "Guardians" verify field data with slashing penalties for fraud.

VENTURE CAPITAL PITCH DECK

- **Problem:** 2025 carbon credit trust crisis.
- **Solution:** On-Chain transparency & dNFTs.
- **Traction:** 245,000 trees planted; \$1.2M distributed via Green Lending.

SOCIAL MEDIA STRATEGY

- **X (Twitter):** "Your crypto can save the planet. Join the Union."
- **LinkedIn:** "CSR PDFs are obsolete. Use our Enterprise API for real-time ESG."
- **TikTok/Reels Script:** "This isn't a crypto app; it's a tool to save the world. Cycle to work, earn \$TRE."

SUMMARY

UnionTre is a decentralized ReFi protocol launched on Dec 31, 2025. It creates a bridge between digital wealth and biological health. With a supply of 1B \$TRE, a deflationary burn mechanism, and AI-driven satellite verification, it has already secured 245,000 trees and \$25M in TVEL as of early 2026. The project is fully compliant with MiCA/EU regulations and operates out of Zurich and Warsaw.