Technical Document: Token-Catalyst

This document describes the smart contract architecture, token mechanics, DAO governance system, and interaction with physical catalyst infrastructure.

1. Token Architecture

- Token Type: ERC-20 or ERC-1155
- Minting: mint() based on verified energy potential
- Burning: burn() when energy is consumed
- Binding to catalyst: registerCatalyst()
- Validation: verifyEnergy() via oracle/API
- Metadata: energy source, capacity, and location

2. Catalyst Interaction

- Each token is linked to a specific catalyst system
- Catalyst must be capable of producing hydrogen or electricity
- Evaluation: power (kW), efficiency (electrolysis/generation), energy source, certification

3. Oracle Infrastructure

- Required for real-time telemetry and catalyst verification
- Integration examples: Chainlink, API3, Band Protocol

4. DAO Governance

- Governance tokens distributed to ecosystem participants
- Voting on new catalyst registration and protocol parameters
- Multisig and audit-ready smart contract logic

5. Security

- Smart contract audit required
- Oracle manipulation resistance
- Transition to full DAO control post-launch