SmartSentinels — Whitepaper v0.2
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Executive Summary

SmartSentinels is building a decentralized network of AI agents powered by a new mining model: **Proof of Useful Work (PoUW)**. Unlike traditional mining, SmartSentinels agents perform high-value, real-world services for businesses (e.g., verifiable smart contract audits, legal document analysis, custom B2B assistants). The verified output generates SSTL tokens distributed on-chain based on measurable, useful computation.

Key Innovations & Institutional Appeal:

- **Verifiable AI Compute:** PoUW emission is directly tied to verifiably secure, useful computation, creating a foundational trust layer for AI services.
- **Edge-Native Infrastructure:** AI agents run efficiently on low-power edge devices (like NVIDIA Jetson Orin) or cloud GPUs, ensuring global accessibility and low operational costs.
- **Deflationary Mechanism:** A **10% mandatory burn** is implemented on every PoUW token emission, ensuring network usage drives long-term token scarcity and sustainability
- **Long-Term Alignment:** Core team and strategic reserve allocations are secured by the institutional standard of a **12-month cliff and 36-month linear vesting** (4 years total).
- **iNFT Identity:** Each agent is linked to an iNFT identity (ERC-7857), tokenizing the AI asset and enabling transparent tracking and monetization of intellectual property.

Context & Problem: The Trust and Utility Gap in AI

The multi-billion dollar AI market requires trust, transparency, and scalable, cost-effective computational infrastructure.

- **Trust and Integrity Gap:** Businesses need verifiable AI output, with integrity proofs and transparency in reward allocation. Centralized cloud computation (like Google Cloud) remains expensive and opaque.
- **Monetization Inefficiency:** Web3 lacks a native, low-energy mechanism to monetize distributed AI compute power and verify that the output is genuinely useful, leading to a "Mining Inefficiency" problem.
- **Supply Shock Risk:** Many high-FDV projects fail due to weak vesting or lack of utility, leading to sudden price drops upon token unlocks.

The SmartSentinels Solution: Verifiable AI Agents

SmartSentinels solves these structural weaknesses by providing a decentralized, tokenized trust layer for AI services.

1. Verifiable, traceable token emissions based on real output

2. A low-energy, tokenized infrastructure for decentralized AI services

PoUW Mechanism: Utility-Driven Emission & Deflation

Every time an agent completes a verifiable task (e.g., completes a smart contract audit, handles a customer call), the **MCP (Model Context Protocol)** verifies the output and calls `mintPoUW()` on-chain. SSTL tokens are minted and distributed automatically:

- **NFT Holders : 60%** Holders of iNFTs tied to the active agent's device (incentivizes asset ownership).
- **Treasury / Staking 20%** Fuels ongoing staking rewards, protocol incentives,
- **Business Clients 10%** Rebates/rewards for clients who hire the agent, incentivizing adoption.
- **Burn10% Permanently removed from supply** to control inflation and enhance token scarcity.

Why the Model is Sustainable:

- Token emission is directly tied to measurable, high-value business output, ensuring the supply growth is always accompanied by utility demand. The **10% Burn** acts as an immediate and permanent token sink, defending long-term token value.

- Anyone can contribute hardware and earn — community-scale PoUW

- Every task completed by the network permanently deletes tokens from supply — adoption literally makes SSTL scarcer.

Technical Architecture

1. Edge Layer (AI Agents)

- Devices: **NVIDIA Jetson Orin**, cloud GPU , AMD-based mini-PCs with NPU or GPU acceleration
- Models: Specialized LLMs and agents (smart contract analysis, appointment bots, legal document review etc.)
- Output includes: task logs, runtime metrics, hashed reports

2. MCP (Model Context Protocol)

- Role: Validate work, sign off on `mintPoUW()`, enforce cooldowns, prevent spam
- Anti-abuse: sampling, cooldowns, rate limiting, anomaly detection, agent scoring

3. On-Chain Layer (BNB Smart Chain)

- **SmartSentinelsToken (SSTL)**:
    - BEP-20 with `AccessControl` roles
    - `MCP_OPERATOR_ROLE` → only this role can mint PoUW tokens
    - `mintPoUW()` function with transparent distribution
    - Automated halving based on supply or task count milestones
    - Constructor has **no parameters**, for transparency & auditability

4. Intelligent NFT (iNFT) Implementation (ERC-7857)

- **Verifiable AI Identity**: The iNFT serves as the unique digital identity for the AI agent, allowing transparent tracking and verification of its on-chain performance.
- **Dynamic and Private Metadata**: Unlike static NFTs, iNFT metadata (which represents the trained intelligence) can be updated in real-time to reflect reputation, completed tasks, or SSTL tokens mined. The ERC-7857 standard is crucial as it ensures this sensitive data remains encrypted and confidential during ownership transfer.
- **Seamless Upgrades:** New or improved AI models can be linked smoothly to the iNFT, allowing the holder to always see the agent's current capabilities.
- **Extended Flexibility:** By utilizing iNFTs, our network can integrate "all sorts of models running on all sorts of devices, trained by all sorts of people," ensuring that the intellectual property of every contributor is secured and monetizable, transforming NFTs into dynamic, verifiable representations of revenue-generating assets.

5. Reports & Storage

- Agent output is hashed on-chain

- Full reports are uploaded to off-chain storage (IPFS/local), linked with integrity proofs

Tokenomics

Token Name: SmartSentinelsToken (SSTL)

Type: BEP-20
Total Supply: 100,000,000 SSTL is the hard cap. Of this, 40,000,000 are allocated to PoUW and emitted gradually via mintPoUW(). No new supply is created beyond this allocation. Burns reduce circulating supply but do not increase the cap.

Category	%	Tokens	Vesting / Lockup
Proof of Useful Work	40 %	40,000,000 SSTL	Dynamic Minting, **10% Mandatory Burn** per emission [Query]. Controlled by Halving Schedule (4 phases).
Liquidity & CEX Listings	15 %	15,000,000 SSTL	7% for DEX (**locked 3 years**), 8% for CEX (**unlocked gradually** upon listing)
Strategic Reserve	10 %	10,000,000 SSTL	Locked for **12 months**, then **linear vesting over 36 months**
Marketing & Growth	15 %	15,000,000 SSTL	**6-month cliff**, then **24-month linear vesting**
Team Allocation	10 %	10,000,000 SSTL	**12-month cliff**, then **36-month linear vesting**
Fundraising (Seed, Private, Public)	10 %	10,000,000 SSTL	**Seed**: 12mo Cliff, 18mo Linear Vesting **Private**:6mo Cliff, 12mo Linear Vesting **Public**:25% TGE Unlock, 75% 3mo Linear Vesting

Fundraising Valuation Strategy (FDV Scenarios)

The Seed raise will utilize a dynamic pricing model (e.g., LBP/auction) through the Seedify incubation to maximize capital from the 3,000,000 SSTL allocation, anchoring the project at a premium valuation comparable to Tier-1 AI infrastructure projects.

Scenario	**Price Per Token**	**Implied Fully Diluted Valuation (FDV)**	**Target Capital Raised**	Strategic Rationale
Competitive Baseline	**$1.00 USD**	**$100,000,000**	$3,000,000	The median institutional valuation floor for competitive crypto infrastructure deals. It serves as the lowest end of our market benchmark.
Aggressive Floor (Seed Start)	**$2.50 USD**	**$250,000,000**	$7,500,000 (Minimum)	The minimum FDV target, validated by robust tokenomics and positioning in the high-growth AI compute sector.
Target Maximized Capital (Seed Avg.)	**$5.00 USD**	**$500,000,000**	**$15,000,000**	The goal of the dynamic auction, achieved by high investor demand for the 3% allocation. This validates the project as an immediate unicorn project.

Our FDV targets are benchmarked to Tier-1 AI infrastructure projects. Even at $500M, SSTL enters the market at a fraction of Bittensor's $4B FDV, leaving significant upside.

Halving Schedule

To control inflation and reward early participants, SmartSentinels introduces a halving mechanism tied to total PoUW emissions. The initial minting rate (R_0) decreases in phases:

- Phase H0: From 0 to 10 million SSTL — full rate (100% R_0)
- Phase H1: From 10 to 20 million SSTL — half rate (50% R_0)
- Phase H2: From 20 to 30 million SSTL — quarter rate (25% R_0)
- Phase H3: From 30 to 40 million SSTL — eighth rate (12.5% R_0)

This ensures early contributors are incentivized and long-term inflation remains under control.

Anti-Abuse Mechanisms

To prevent misuse of PoUW minting, the protocol includes several layered defenses:

- Rate limits per device, enforced hourly and daily
- MCP verification logic that scores agents and blocks spam
- Cooldowns and randomized sampling of submitted tasks
- Reputation scoring for agents based on accuracy and behavior
- Reward reduction or slashing if abnormal patterns are detected

All PoUW emissions require MCP verification — without cryptographic proof, mintPoUW() cannot be called. This ensures minting cannot be faked, front-run, or spammed.

Hardware Efficiency

SmartSentinels is designed for edge deployment on efficient, locally owned hardware:

- **Jetson Orin (~25W)**: Ideal for running real-time inference 24/7
- **MinisForum UM790 Pro**: Suitable for heavier workloads or multi-agent deployments

Energy costs are minimal. At ~0.6 kWh per day per device, the electricity cost is around €0.12/day. With projected revenues of $0.50–$2.00/day per agent, ROI is attractive even at a small scale.

Revenue Model

SmartSentinels generates value through several monetization paths:

- Business clients pay for access to AI agents through subscription or per-task models
- An upcoming agent marketplace allows businesses to rent specialized agents, with a platform fee applied
- Premium services include extended audit reports, SLA guarantees, and enterprise support
- The treasury can also drive protocol revenue through staking incentives or token buybacks
- SSTL is required to access premium audits (discounts if paid in SSTL).
- Businesses get rebates in SSTL for using agents.
- Stakers may receive boosted access to PoUW rewards.

Market Opportunity

SmartSentinels operates at the intersection of three high-growth markets: AI, DePIN (decentralized physical infrastructure), and real-world asset-backed tokenization.

- Global smart contract audit market: **$1.2B in 2024, CAGR ~20%** (source: CertiK, Hacken, etc.).
- AI audit/legal assistant markets: **Projected $20B+ by 2030**.
- DePIN sector: **$30B+ by 2030** (Messari, Cointelegraph Research).

Initial go-to-market targets include:

- Web3 founders in pre-launch stages needing audit reports
- Medical clinics or law firms needing intelligent assistant agents
- **Web3** founders needing secure smart-contract audits (MVP), and enterprises needing intelligent assistant agents (medical/legal).

Competitive Edge

SmartSentinels brings several competitive advantages:

- Value is only generated when AI agents produce useful, verifiable work
- Edge deployment on 25W devices makes the model globally accessible
- The token smart contract uses security best practices and is fully auditable
- Anyone can deploy an agent and start earning — no mining farms, no GPU war
- Agents are customizable for different verticals (audit, medical, legal, support)

Project	FDV	Mechanism	Lesson for SSTL
Bittensor (TAO)	$4B	Decentralized AI compute	Proves demand for PoUW-like infra
Sahara AI	$1B	AI marketplace	Validates edge-AI monetization
SSTL (Seed)	$100M–$500M	PoUW + iNFT identity	Competitive entry with superior vesting model

Roadmap

The product roadmap is divided into four key development phases:

- **Q4 2025**: Launch testnet version of SmartSentinelsToken, integrate ThirdWeb authentication, deploy first audit AI agent
- **Q1 2026**: Mainnet deployment, launch of NFT collections tied to devices, 10–20 edge agents activated
- **Q2 2026**: Launch beta version of the Agent Marketplace, onboard 50+ devices, initiate halving phase H1
- **Q3 2026**: Scale to 100+ devices, onboard business clients.

Traction

SmartSentinels is already making progress:

- Founder is Selected for the **BNB Martians** program
- Integrated **ThirdWeb** for safe auth and tools to build and create agents.
- NFT logic is tied to device identity for fair distribution
- First B2B audit agent is active in testnet and generating reports

KPI Targets

Key performance indicators that guide the project include:

- Number of active edge devices and daily uptime percentage
- Number of verified tasks submitted per day
- Daily SSTL token emissions (PoUW only)
- Task success/failure rate
- Monthly revenue from business clients
- Earnings per device per day and ROI for hardware operators

Risks & Mitigation

SmartSentinels is designed with risk reduction in mind:

- **Device availability**: We plan to pre-order and diversify suppliers
- **Contract vulnerabilities**: Contracts undergo both internal and external audits
- **Regulatory uncertainty**: We'll work with legal experts to stay compliant and transparent
- **Adoption resistance**: We'll focus on ROI demonstration, case studies, and free pilots

Security & Transparency

Security is built into every layer:

- Contracts follow OpenZeppelin standards and are fully auditable
- On-chain and off-chain logic is tested extensively
- Thirdweb provides user verification and embedded wallet safety
- Audit reports and agent logs are hashed and timestamped on-chain for integrity

Founders

Andrei Galea – Co-Founder & Lead Developer

- Blockchain & AI infrastructure builder
- Background in embedded systems, system integration, and Solidity smart contracts
- Leads architecture design, smart contract development, MCP coordination, and AI agent lifecycle
- Former technician in industrial automation, now full-time Web3/AI systems architect
- Active participant in BNB Chain programs (BNB Martians, Hackathons, Grant Pipeline)
- Spearheading integration of ThirdWeb, on-chain token logic, and staking architecture

Darius Galea – Co-Founder & Operations Lead

- Co-founder and key contributor to operational execution of SmartSentinels
- Focuses on logistics, procurement, hardware deployments, and legal-compliant onboarding
- Background in technical field work and network support; transitioned into Web3 hardware ops
- Manages device inventory, customs & procurement processes (especially edge device import from Asia)
  Coordinates onboarding of business clients and supports partner relationships for B2B use cases

David Nagy Elex – CMO

- Strong advocate of **collaboration, lifelong learning, and challenging the status quo**, bringing fresh perspective to every initiative.
- Skilled in **communication, problem solving, and strategic refinement**, with a proven ability to guide teams toward meaningful impact.
- Passionate about **crypto, markets, and decentralized finance**, combining attention to detail with a tech-savvy mindset to drive innovation.

Links

- Website: www.smartsentinels.net
- Pitch Deck: www.smartsentinels.net/documents
- GitHub: github.com/C00K1E-dev/smartsentinels
- LinkedIn: Andrei Galea