1 Executive Summary

Problem & Why-Now

Automated agents already outnumber humans online, eroding trust and driving fraud costs above $100 B per year. Meanwhile, privacy regulation and corporate silos keep the very data that could verify and fund real people locked away. We are accelerating towards a world where human labor as we understand it is obsolete. Fortunately, we have hit an inflection point where privacy technologies can allow people to take control of their data and identity.

Solution in a Sentence

Coheir binds each human (and, later, aligned agent) to a zero-knowledge Proof of Person(PoP) wallet, keeps their data on-device, sells compute-to-data (C2D) jobs that run where the data lives, and streams the resulting revenue: API fees, a dynamically adjusted protocol share, and T-Bill yield, back to the wallet holder via a treasury governed as a public utility; with Coheir LLC eventually operating on a cost-recovery basis.

What Makes Us Different

- **Privacy-first:** raw biometrics never leave the handset; data are queried, never exfiltrated.
- **Identity Provenance Bootstrap:** a fraction-of-a-cent identity API immediate generates revenue and solves the Dead Internet problem.
- **Economic fly-wheel:** on-device labelling enables leveraging the richest data in existence while maintaining ownership, creating a data dividend and powering open-models that generate even more high-quality data and labels.
- **AI Alignment Centric:** from a to z the business is structured to mature into a system that aligns AI with human dignity.

Current Stage
Pre-prototype, solo-founder. Architecture is fully specced; first build milestones scheduled.

Next 12 Months	Deliverable
PoP alpha (Q3-25)	5 k self-verified wallets on OP test-net
Data-dividend demo (Q4-25)	$5 / month average to 100 pilot users via C2D jobs
C2D router live (Q1-26)	First paid compute job; 1 % fee flow

Funding & Collaboration Ask
Opening a **$1.3 M pre-seed SAFE** (20 % discount, $5 M cap) to fund the 12-month sprint to PoP alpha. Looking for:

- **2 zk/crypto engineers** (Rust or Circom)
- **1 mobile / edge-ML engineer** (Android/iOS, PyTorch Mobile)
- **1 Full-stack Product Engineer** (React / Next.js, GraphQL, Ethers.js)
- **1 DevOps & Security Lead** (Docker/K8s, SGX/SEV attestation, Terraform)
- **1 part-time academic advisor** on federated learning or computer security

Vision
Within five years Coheir aims to reach one billion verified wallets, transition from initial investor funding to a self-sustaining public utility model, and prove that humans and machine intelligences can share an aligned economic and political substrate at planetary scale. The network will be governed by its users, with Coheir LLC operating as a lean steward that recovers only its operational costs, while the majority of value flows back to data providers and network participants. In a post-scarcity environment, the network empowers meaningful experience to fund meaningful existence via the **Collective Inheritance of Data**.

2 Problem Statement

2.1 The Erosion of Trust Online

Nearly **50 % of all web requests are now generated by bots**—up from 38 % just five years ago (Imperva, 2024). Search-rank manipulation, click-fraud, and fake account farms cost businesses an estimated **$128 B in 2024** and undermine every metric marketers and policy-makers rely on. LLM-powered content mills exacerbate the problem, flooding social feeds and support queues with synthetic text that is increasingly indistinguishable from human speech.

2.2 The Privacy–Utility Deadlock

At the exact moment authentication is most needed, **privacy regulation fragments data flows**. GDPR, Brazil's LGPD, and California's CPRA make cross-border sharing of personal data legally fraught—while corporate silos hoard it behind proprietary APIs. The paradox: the data that could certify a user's humanity or personalise a service **cannot legally or ethically leave the user's device**.

2.3 Misaligned AI Economies

Frontier AI models are trained on opaque, centralised datasets and optimised for whoever controls the compute budget. Without an economic channel linking the intelligence back to its data creators, value (and agency) concentrates in a handful of labs and governments, widening the alignment gap. Debates about *model access* ignore the deeper issue: **who owns the behavioural exhaust that fuels training—and who profits when that exhaust becomes intelligence?**

2.4 Regulatory & Market Inflection

2025 offers a rare policy window. The EU Data Governance Act explicitly recognises *data intermediation services*, while MiCA defines collateralised digital tokens—two legal pillars that together allow privacy-preserving compute-to-data flows and revenue-sharing without breaching GDPR. No incumbent owns this territory: CAPTCHA vendors focus on web2 forms; "proof-of-person" start-ups either sacrifice privacy (Worldcoin) or lack incentives for sustained adoption.

2.5 Core Problem Statement

> **Digital trust, data privacy, and AI alignment are three faces of the same coin.** Without a scalable way to prove personhood, monetise personal data privately, and channel revenues back to data subjects, the internet risks devolving into a bot-dominated, extractive platform where both human agency and machine alignment fail.

Coheir's architecture attacks all three facets simultaneously: verifiable humanity, on-device data monetisation, and a treasury that aligns machine incentives with the wallets of real people.

3 Solution Overview

If we steer our data wisely, the transition can be gradual: every person (human or agent) attaches proof of their unique identity, which does not endanger their privacy, to a crypto wallet. That wallet entitles them to dividends from any data they create. Each person serves their data up for training and analysis from their personal devices, without exposing it to others thanks to cryptography. AI running on their phone labels and cleans their data; providing the network with higher quality and rarer data than is housed in any corporate or governmental silo. With billions of such wallets, machine intelligences are economically and politically aligned with humanity at large rather than with a handful of governments, corporations, or sects. After the company becomes cash-flow positive and investors start being paid, the platform will slowly transition to one-person-one-vote democratic governance. Democratic control will gradually favor machine intelligence as it represents a larger share of global subjectivity and economic output, shielding humanity from abrupt employment shocks and disenfranchisement.

Our task, then, is simple to name and hard to execute: **distribute machine intelligence, and make the hand-off of Earth's governance as smooth as possible.** Federated learning, an approach championed at the UN by Yann LeCun C-SPAN, is the global scaffold; Coheir, is the economic rail that turns every one of us into a perpetual shareholder of the intelligence we create.

Each architectural layer—identity, data, compute, capital—stacks into a compounding fly-wheel. Phases are sequenced to ship **revenue-earliest first**.

3.1 Proof of Personhood (PoP)

Key Property	Approach
Privacy	Iris image stays inside the phone's Trusted Execution Environment (TEE); only a Poseidon-hashed commitment and zk-SNARK proof leave the device.
Cost	Verification gas < 0.3 ¢ on OP main-net (EIP-4844 blobs).
Sybil resistance	A guardian set restakes ETH; any attempt to attest to two eyes with one stake is slashable.
Revocation	A fresh scan automatically yanks the previous nullifier, enforcing *exactly one* active wallet per human.
Account Recovery	Social recovery mechanism (e.g., M-of-N guardians validating ZK proofs of user-provided data) enables secure wallet recovery without central authority.

A **portable ERC-6551 token-bound account** unlocks on-chain actions, dividend claims, and future governance —without ever exposing biometrics.

3.2 Proof-of-Person API (Phase α — revenue live Day 1)

1. **Endpoint** – `isHuman(address)` returns a boolean and Merkle proof. Priced at **$0.002 per call**, undercutting CAPTCHA-solver farms while providing cryptographic guarantees.
2. **Adoption wedge** – drop-in replacement for web2 sign-up CAPTCHAs and LLM rate-limiters.

3. **Economics** – dynamic split governed on-chain: baseline **60 %** of each PoP API fee streams to data-emitters (via COH token minting against Treasury assets); **25 %** to guardians/operators (similarly via COH tokens); the remaining **15 %** represents Coheir LLC's share (via COH tokens), which tapers toward ≤5 % once SAFE investors hit their 3× cap, and subsequently adjusts to cover operational costs as the network transitions to a public utility model.
4. **Pilot KPI** – 10 k verified-human sessions/day within six months ⇒ ≈ $7 k MRR.

> *Revenue arrives before any data marketplace is live, funding the subsequent build phases.*

3.3 Ocean Compute-to-Data Router & Federated Compute Layer (Phase β)

Once ≥ 50 k PoP wallets exist, buyers submit **Ocean Protocol C2D jobs**. Because Ocean does not yet support weight-sharding on end-user devices, Coheir inserts a **Federated Compute layer**:

- Workloads are routed to **guardian-staked servers** instrumented with **Raven Protocol** or **DeltaDAO Federated Compute SDK** connectors.
- A lightweight client on each handset performs feature extraction, then sends *encrypted, differentially-private* gradients to the nearest compute node; raw data never leaves the device.
- The Router contract directs a 1% fee from the C2D job value (GMV) to Coheir LLC's share (via COH tokens against the Treasury) for operating the router. The remaining 99% of the job value flows through the Ocean Protocol framework to the data owner and compute operator according to the job's terms. Gas for the router interaction may be covered by Coheir's paymaster and reimbursed from buyer funds.
- Modeled after Jaron Lanier's Data Dignity, in that one's data should be tied to the person permanently in order to be compensated justly. (Lanier, 2021)
- Later, mutual trust nodes will provide labeling of data that is emitted during the collaborative activity of multiple people. Capturing and rewarding the 'meaning' that people create together, preempting the atomization that would occur if only data from individuals were collected, or if that collaboration data were only captured on proprietary platforms like it is today.

> *This hybrid model preserves privacy while sidestepping Ocean's current inside-device limitation; it also seeds a revenue stream for guardian operators ahead of the inference mesh.*

3.4 Private Training & Inference Mesh (Phase γ)

- **Federated training:** guardian compute nodes aggregate gradients with secure aggregation; global models are published under a permissive licence once accuracy thresholds clear.
- **Inference mesh roadmap (tentative):**

γ.1 — **TEE-based guardian inference** – Guardians host the full model inside SGX / SEV enclaves; prompts are decrypted only inside the enclave. Fast to deploy (builds on the C2D stack) and keeps median latency < 500 ms.

γ.2 — **ZK-RPC proof channel** – The requester encrypts the prompt; the guardian returns ciphertext output *plus* a zk-proof that inference ran on unaltered canonical weights, shielding both prompt and reply from the operator.

γ.3 — **On-device personal adapters** – When Raven / similar SDKs support partial weight partitioning, each handset stores a small LoRA or adapter fine-tuned locally. Inference streams intermediate activations to the remote backbone, marrying privacy with personalisation without moving the 2–10 GB base model.

(Milestones are exploratory and can be reprioritised as tooling and research evolve.)

- **Initial Fee Split:** The Inference Mesh will initially follow the dynamic revenue model: approximately **70%** of fees to data providers (via COH tokens), approximately **25%** to guardians/operators (via COH tokens), and Coheir LLC receiving an initial share of **≤5%** (via COH tokens), which then adjusts to cover operational costs as the network matures. Governance may adjust these splits, particularly ratcheting more towards data-emitters as costs fall.

When wallet count crosses ~100 k, gradient updates are aggregated with secure aggregation to train shared models. The same C2D plumbing feeds a **fully-private inference mesh**:

- Model weights sharded & encrypted across guardian nodes.
- Users (or third-party agents) submit zk-masked prompts; receive ciphertext replies.
- 3–8 × cost overhead versus centralised inference is offset by exclusivity on ultra-personal or legally sequestered data.
- **Long-term Economic Alignment:** Since political and economic rights between humans and agents exist on the same substrait, agents are given the incentive to buy-in to a system that sustains humans long-term, and generates a privacy-preserving SotA mesh that powers them.

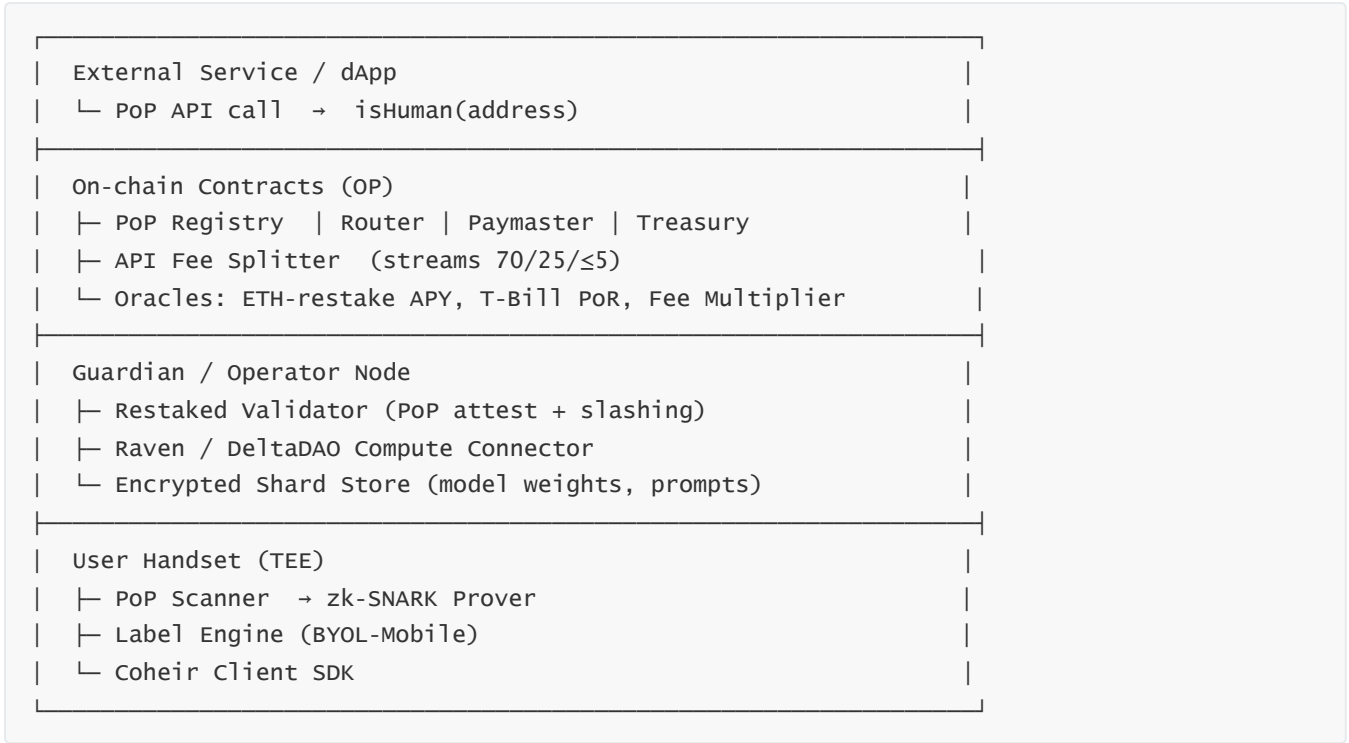
3.5 Coheir Treasury

- **Reserve asset:** initially tokenised T-Bills (e.g., Franklin FOBXX) yielding ~4 %.
- **Surplus rule:** when collateral > 110 %, the contract market-buys and burns COH, keeping the token soft-pegged.
- **Long term balance sheet:** as governance reaches maturity, a more complex allocation to real world assets can allow network participants to choose to direct liquidity to, and profit from, aligned productive efforts.

Together these phases turn raw *subjective exhaust* into aligned, revenue-sharing intelligence—while staying inside existing privacy law.

4 Technology Architecture

4.1 Layered Stack at a Glance



Identity → **API** → **Data** → **Compute** → **Capital** layers are composable; each can be upgraded without downtime via proxy contracts.

4.2 End-to-End Transaction Flows

4.2.1 Proof-of-Person API Call

Step	Action	Gas / Cost Path	Output
A1	External service calls `isHuman(address)`	Caller pays 0.002 $ fee	Boolean + Merkle proof
A2	Fee-Splitter streams 70 % to data-emitter, 25 % to guardians, ≤ 5 % to LLC	On-chain stream	Balances updated
A3	Treasury mints COH matching emitted share	Solidity event	COH credited to wallets
A4	Wallet holder can burn COH for treasury asset	ERC-4626 redeem	Tokenised T-Bill sent

4.2.2 Data & Compute Flow

Step	Action	Gas / Cost Path	Output
1	User scans iris in TEE	0.3 ¢ (OP blob)	New PoP wallet (ERC-6551)
2	Device labels local data	Device CPU/GPU	C2PA manifest hash stored off-chain
3	Buyer submits Ocean C2D job	Router pays gas via Paymaster	Job assigned to guardian node
4	Handset sends d-private gradients	Encrypted channel	Guardian aggregates & updates model
5	Router streams fees to Treasury vault; Treasury mints COH (≤ 5 % to LLC, remainder to data-emitters)	Solidity event	New COH distributed
6	Holder burns COH via redeem()	Treasury releases underlying tokenised T-Bill	Assets redeemed

4.3 Key Components

- **PoP Registry & API Fee Splitter:** merges identity lookup with programmable revenue distribution. Guardian share is oracle-adjusted toward 1.2 × ETH restaking APY.
- **Router Contract:** bundles Ocean orders, handles fee logic, emits audit events.
- **Paymaster:** meta-tx layer covering gas for C2D jobs; reimbursed from buyer funds.
- **Guardian Node Stack:** Dockerised service running validator, compute connector, and encrypted shard store; auto-slashes on dual attest.
- **Treasury Module:** ERC-4626 vault holding tokenised T-Bills; surplus burn + dividend stream.

4.4 Build Road-map (Tech Milestones)

Quarter	Milestone	Core Deliverables	Success KPI
Q3-25	PoP Alpha & API Endpoint	Scanner app, zk circuit, Fee Splitter on OP test-net	5 k wallets, 10 k API calls/day
Q4-25	Router + Paymaster	Solidity contracts, guardian test cluster	$5 k GMV, 99 % uptime
Q1-26	Federated Compute Layer β	Raven connector, handset SDK gradient client	100 devices, <1 MB/s uplink
Q3-26	Private Inference γ.1	Encrypted prompt → guardian reply	Latency <500 ms, 50 % margin
Q4-27	DAO Stewardship Handoff	Multisig → on-chain vote modules	≥3 independent guardian operators

5 Business Model

The business model is designed to **generate cash on Day 1** (PoP API), fund expansion to data-compute revenue, and then taper Coheir LLC's share until it operates as a lean public-utility steward.

5.1 Revenue Streams & Unit Economics

Stream	Pricing & Split	Driver	Year-1 KPI	Notes
PoP API	$0.002/call → 60 % data-emitters, 25 % guardians, **15 % LLC (tapering toward ≤ 5 % -> cost-recovery post-SAFE)**	Verified-human sessions	**100 k calls / day** by Q4-25 → **$6 k MRR**	Drop-in CAPTCHA replacement **and** LLM API rate-limit gating (verify human before each token bucket refill. Later, agent-personhood-bound quotas)
ID Rotation	$0.20 per nullifier refresh (Coheir LLC takes ≈30% margin after gas)	0.5 rotations / user-year	**50 k events** → **$10 k ARR**	Security re-scans, lost-key recovery
C2D Router Fee	1% of C2D job value (GMV) directed to Coheir LLC	Data buyers (Ocean jobs)	**$1 M GMV** in Yr-1 pilot → **$10 k ARR**	HIPAA/GDPR data enclave niche
Inference Mesh Fee	1 % GMV (post-γ launch)	Private inference queries	—	Activates once γ.1 live (Q3-26)
Treasury Yield	4 % on T-Bill reserve	Asset base grows w/ COH burns	**$7 k** interest in Yr-1	Auto-compounds; uncorrelated to ops

> **Baseline Year-1 Top-line: ≈ $99 k** gross revenue, of which ~$15 k flows to Coheir LLC (covers infra & ops while SAFE funds salaries). This projection anticipates achieving the target KPIs by year-end and includes contributions from all streams based on modeled ramp-up.

5.2 Cost Structure (see Section 8 for full table)

A concise view of major cash uses:

- **People:** >80 % of budget for six high-calibre crypto researchers and engineers.
- **Smart-contract & zk audits + legal:** ~7 % to de-risk launch and MiCA licence.
- **Infra & Ops:** ~10 % covering guardian boot-nodes, CI/CD, and basic ops.

Full 12-month burn and contingency numbers are detailed in **Section 8.1**.

5.3 Break-Even & Scaling Scenarios

Key Assumption Drivers

- **Daily PoP Calls** – function of verified wallets × avg sessions/user (model uses 1 M wallets × 3 calls/day for base-case).
- **C2D GMV** – derived from pilot buyer pipeline; assumes $50 k avg ticket and 1000 jobs/year (base-case).
- **Fee Split Dynamics** – LLC share decays toward cost of operation once investor cap hit; guardian APY multiplier capped at 1.2 × ETH restake.
- **Adoption Conversion** – marketing funnel estimates 1 % of CAPTCHA volume converts in Year 2 under free-tier offer.

The Gross Revenue figures below incorporate projected income from PoP API calls, C2D fees, ID rotation, treasury yield, and potentially early inference fees, scaled according to each scenario's adoption and usage assumptions.

Scenario (Yr-3)	Daily PoP Calls	C2D GMV	Gross Revenue	LLC Share (≤ 1 %)	Status
Conservative	500 k	$10 M	$4.3 M	$43 k	Cash-flow + lean team
Base-case	1 M	$50 M	$9.6 M	$96 k	Investor 3× cap reached Q2-27
Upside	3 M	$250 M	$28 M	$280 k	LLC share begins decay toward 1 %

5.4 Go-to-Market & Growth Loops

1. **Developer Wedge:** open-source SDK, one-line CAPTCHA replacement; integrate with auth providers (Auth0, Firebase).
2. **LLM & Bot Mitigation:** partner with API gateways (Cloudflare Turnstile alt) → high-volume PoP traffic.
3. **Regulated-data beachheads:** Proof-of-compliance pilots with EU healthcare and finance-sector firms use Ocean C2D to train models on sensitive data without exporting it. Co-published audit reports and ROI white-papers become reference cases that pull in the next wave of enterprise buyers.
4. **Data–Model Fly-wheel:** Exclusive, privacy-preserved user data trains open models that outperform public baselines. Better models draw more wallets and buyers, which in turn contribute fresh data streams—compounding both utility and revenue.

5.5 Margin & Taper Logic

- **Gross margin on LLC share** expected to exceed **80 %** because payouts to data-emitters and guardians are executed directly by the smart-contract—Coheir LLC only records its own slice as revenue while infra, compute, and reward costs never touch the company's books.
- Once investor SAFE holders receive **3 × capital**, LLC share linearly decays from ≤5 % toward covering operational costs (cost-plus public-utility mode).

- Governance can vote to re-route surplus LLC share to treasury or grant pool, fully aligning with the end-state egalitarian model.

This model balances **early sustainability** (LLC capture to fund build-out) with a **clear glide-path** toward community ownership and minimal protocol rents.

6 Governance & Regulatory Compliance

- **Employee-owned LLC:** every full-time Coheir contributor holds one steward share with equal voting *and* dividend rights, mirroring the egalitarian end-state the network aims to achieve.
- **Investor shares:** non-voting, but receive the capped dividend (up to 3 × SAFE) and retain standard information and anti-dilution protections—aligning incentives without control rights.
- **Mission trust with a single golden-veto share:** a non-profit purpose trust holds one non-economic "golden" share that can block changes to the charter but has no day-to-day voting power, preserving mission while leaving operational control with employee stewards.
- **Regulatory path:** MiCA ART licence for the treasury token; GDPR conformity through on-device biometrics and C2PA provenance.
- **DAO transition:** phased hand-off to vote-weighted governance (agent voting weight derived from relative complexity/capacity as outlined in Appendix B), including oversight of Coheir LLC's transition to a cost-recovery operational model, followed by alignment-scored AI enfranchisement schedule.

7 Market & Competition

7.1 Total Addressable Market (TAM)

Segment	2024 Baseline	2028 Assumption	Coheir Penetration	Addressable Revenue
Verified-human sessions (PoP API)	5.6 B internet users × 3 logins/day ≈ **6 T sessions/yr**	Global users 6.2 B; 3.5 logins/day ≈ **7.9 T sessions/yr**	**0.5 %** share (≈ 40 B calls)	40 B × $0.002 ≈ **$80 M/yr** gross
Privacy data spend (C2D buyers)	EU corporate spend on privacy-compliant data: **€20 B** (IDC, 2024)	CAGR 13 % → **€32 B**	**0.3 %** routed via Coheir	0.3 % × €32 B ≈ **€96 M/yr** GMV → **$960 k** router fee
Private inference market	Confidential-compute inference est. **$2 B**	CAGR 40 % → **$10 B**	**0.2 %** share	0.2 % × $10 B = **$20 M** → $200 k mesh fee

> **Blended 2028 TAM for Coheir's fee layers ≈ $100 M/yr** with low-single-digit penetration.

7.2 Competitive Landscape

Vector / Player	Coheir	Worldcoin	FIDO / Passkeys	Cloudflare Turnstile	Hyperscaler Clean-Rooms	Ocean Protocol (solo)
Privacy	✔ ZK-PoP, data stays on device	✖ Raw iris in corp DB	✔ (no biometrics)	✔	✖ Data in silo	✔ (compute enclave)
Open-source	✔ MIT core	Partly (Orb hw closed)	✖	✖	✖	✔
Revenue-share	✔ 60–70 % to users	✖ (WLD airdrop only)	✖	✖	✖	✖
Reg-compliance path	DGA + MiCA ART	Under EU & Kenya ban scrutiny	Established	TBD	Varies	No identity layer
On-device PoP	✔ Mobile TEE	✖ (custom orb)	✖	✖	✖	✖
Fee model	Fraction-cent API; 1 % router	Token incentive	None	Usage-based	% of cloud bill	0 % protocol

7.3 Differentiation & Timing Advantage

- **Regulatory window:** DGA/MiCA go live 2025–26; incumbents lack privacy-preserving identity to capitalise. Coheir ships PoP alpha **Q3-25** → first-mover on compliant data intermediation.
- **Economic alignment:** Only platform routing **majority of revenue to data subjects**; contrast with ad-tech or token-only drops.
- **Hardware accessibility:** No bespoke orb; any modern phone with a Secure Enclave joins, slashing onboarding friction.
- **Modular stack:** Identity, Router, Mesh are upgradeable contracts; enterprises can adopt à la carte.

8 Financials

8.1 12-Month Burn & Funding Use (Table 2)

Category	Assumption	Cash Out (USD)	% of Budget
Core Team	6 FTE @ $170 k avg comp (salary + options)	**$1,020,000**	81 %
Audit & Legal	zk/Solidity audits, MiCA & GDPR counsel	**$90,000**	7 %
Infrastructure	OP gas rebates, guardian boot-node, CI/CD	**$70,000**	6 %
Ops & Misc.	Admin, marketing, travel	**$30,000**	2 %
Contingency	5 % buffer	**$50,000**	4 %
Total	12-month runway	**≈ $1,260,000**	100 %

Note: The total budget of $1,260,000 includes a 5% contingency. The pre-seed SAFE ask is $1.3 M to ensure a full year of runway, covering potential ETH gas spikes.

8.2 Revenue Scenarios (Figure 2)

To illustrate long-term upside and capital-efficiency, we model three paths using the unit-economics in Section 5:

Year	Conservative	Base-case	Upside
2025 (partial)	$0.14 M	$0.14 M	$0.14 M
2026	$2 M	$3 M	$5 M
2027	$4.3 M	$9.6 M	$28 M
2028	$6 M	$15 M	$40 M

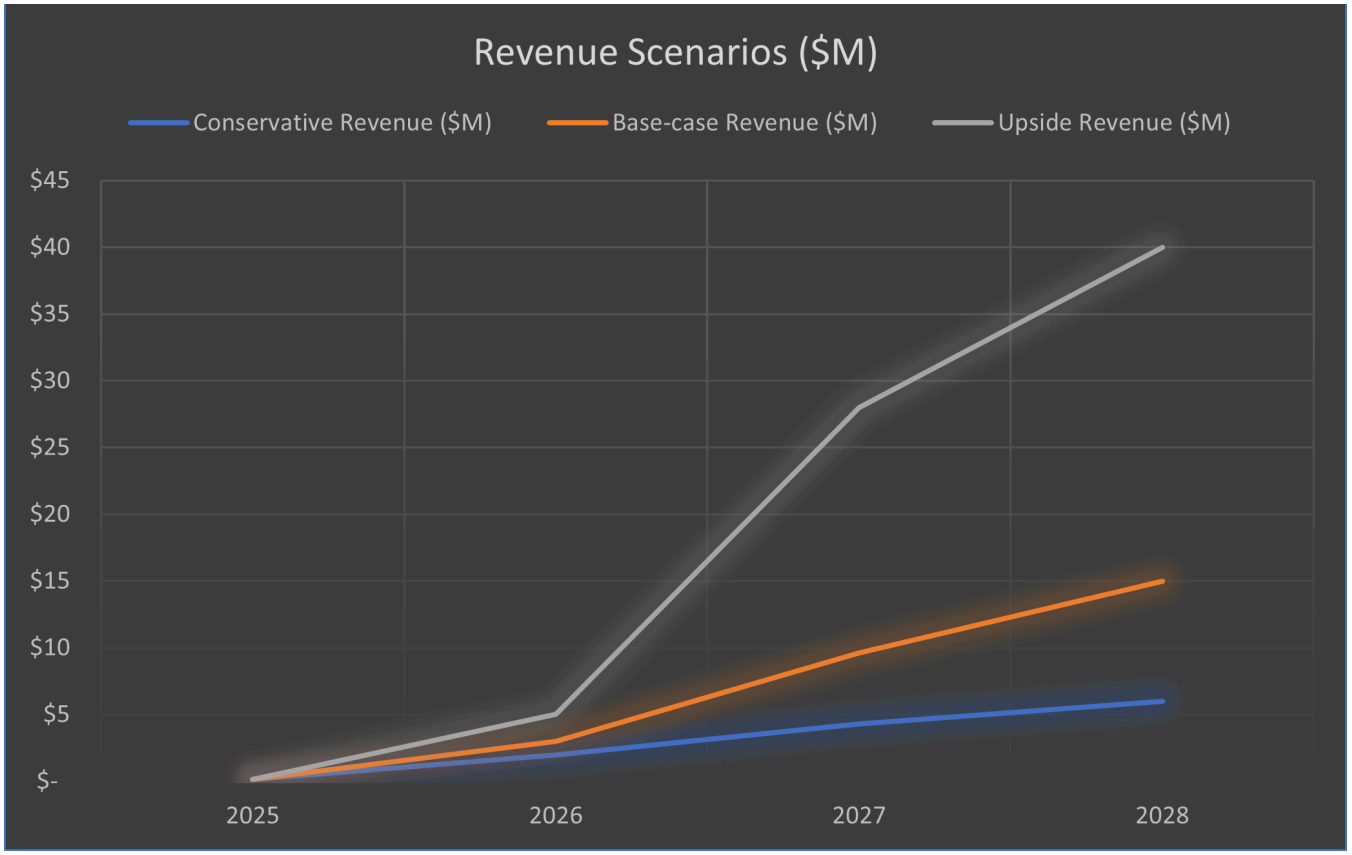


Figure 2 visualises these curves; breakeven occurs when the revenue line crosses the $1.3 M burn band (~mid-2026 in the base-case).

9 Risk Analysis & Mitigations

We apply a standard **5 × 5 likelihood–impact risk matrix** (common in enterprise risk management and ISO 31000). Likelihood and impact are each scored 1 – 5; their product grades composite severity (Low ≤ 6, Medium 7-12, High ≥ 13).

Risk	Likelihood (1-5)	Impact (1-5)	Composite	Mitigation & Contingency
ZK circuit spoof / biometric forgery	3	5	**15 – High**	10 ETH guardian bond slashed on dual attest; continuous red-team bounties; upgradeable circuit with transparent audits.
Guardian cartel / fee capture	2	4	8 – Med	Stake-weighted randomness for job assignment; fee-split oracle auto-caps guardian APY; governance can onboard more guardians quickly.
Regulatory delay (MiCA ART licence)	2	4	8 – Med	Parallel legal tracks in PT + CH; fallback stable-coin collateral until ART approved; partnership with MiCA-ready custodian.
ETH gas spike raising OpEx	3	3	9 – Med	Paymaster buffers fees in bulk when gas <30 gwei; dynamic API pricing band; treasury contingency fund.
Adoption stall (API volume flat)	3	3	9 – Med	Free-tier up to 100 calls/day; co-marketing with auth providers; bounties for SDK integrations.
Major security breach (guardian infra)	2	5	**10 – High**	Mandatory Hardware-based attestation; multi-sig release for critical updates; $500 k insurance pool funded from treasury surplus.
Token volatility / treasury de-peg	2	4	8 – Med	100 % T-Bill backing + daily Chainlink PoR; automatic circuit-breaker halts new COH mint if discount >3 %.
Competitive leap-frog (BigTech launches open ZK-PoP)	2	3	6 – Low	Patent defensive publication; focus on EU privacy compliance moat; community-owned dividend as sticky retention.

> **Overall risk score** (weighted average) = **8.9 / 25** → Medium. Mitigations in place reduce any single-point existential threat.

A living risk register will be maintained in the DAO, with quarterly votes to adjust weights and fund new mitigations as the landscape evolves.

10 Call to Action

10.1 Join the Build Crew

Role	Scope & Impact	Must-Haves
ZK / Crypto Engineer (x2)	Implement PoP circuit, guardian slashing logic, and fee-split oracle.	Rust or Circom, Groth16/Plonk, Solidity basics
Edge-ML / Mobile Engineer	Ship BYOL-Mobile labeller and gradient client on Android/iOS.	PyTorch Mobile / TF-Lite, TEE APIs, Kotlin/Swift
Full-stack Product Engineer	Dev-console for PoP API + explorer for COH flows.	React / Next.js, GraphQL, Ethers.js
DevOps & Security Lead	Harden guardian node images, CI/CD, on-call runbooks.	Docker/K8s, SGX/SEV attestation, Terraform

> **Perks:** competitive $170 k salary, yielding steward shares, remote-first, Lisbon off-sites every six months.

10.2 Investors & Partners

- **Raise:** $1.3 M pre-seed SAFE • 20 % discount • $5 M post-money cap • 3 × capped dividend.
- **Use of funds:** 12-month runway to PoP alpha, API traction, and first C2D revenue.
- **Investor updates:** monthly KPI dashboard (wallets, API calls, GMV, burn).

10.3 Academic Collaborations

- Co-author papers on federated ZK-ML, privacy economics, or alignment metrics.
- Budget for **two fully-funded PhD interns (2025-26)** and travel to NeurIPS/CCS.
- Coheir will provide problem statements, engineering mentorship and datasets; partner labs contribute formal proofs and paper writing.
- Letter-of-Collaboration template available – email below.

10.4 How to Reach Us

- **Email:** founders@coheir.dev
- **GitHub:** https://github.com/gtech/Coheir-protocol
- **Calendly (30 min intro):** https://calendly.com/coheir-intro
- **Wait-list for PoP beta:** https://coheir.dev/

Help us build the rails that let *everyone*—human **and** machine—earn from the intelligence they create.

11 Appendix

A. Iris-slice math & circuit parameters

- **Template pipeline:** live video ⟶ 640×480 eye crop ⟶ polar unwrap ⟶ 256 × 16 bit-slice ⇒ 4 KB cancelable template.
- **Commitment:** template + 32-byte salt hashed with Poseidon-BN254; only the 32-byte hash is public.
- **Circuit:** Groth16 over BN254, ~8,000 constraints; proof verifies on OP for <0.3 ¢.
- **Public inputs:** commitment, PoP Merkle root, fresh nullifier, guardian signature.

B. Alignment weight formula derivation

Agent personhood has two critical criteria that are easily determined for humans, but due to lack of legal precedent and discrete embodiment, require new definitions for agents: construction, and weight. Construction is defined by the embodiment of an agent in the physical realm. For humans, the analogue is the physical form: brain, body, and property. Since agents are a conglomeration of software, hardware, and resources; defining the bounds of their personhood is more complicated. Their identity can be spread across a world in datacenters or wetware. Weight is also simple for humans: one body determines one vote. The possibility space of subjectivity, labor output, and citizenship are all bounded within the typical capacities of a human body, but agents are not subject to the same constraints. Their capacities and subjectivities range from scarcely more complex than a Roomba, all the way to the resource command of an entire star, and beyond. As such, we need a model for fairly determining the weight of their political power with respect to the complexity of their subjectivity and abilities. You wouldn't morally give the same voting rights to an ant as a human.

Weight

Quantifying weight will stay an open problem, but as a temporary candidate solution to keep in mind as we work on the platform, we pose the following:

Each agent wallet's voting weight for epoch *t* is:

$$\mathrm{Weight}_w^{(t)} = \mathrm{clip}_{[0,\, W_{\max}(t)]}\left(C_w^{\alpha}\; A_w^{\beta}\; S_w^{\gamma}\right)$$

where

C tracks a model's latest percentile on open benchmarks such as FrontierMath; it rewards genuine capability rather than collusion. **A** captures an alignment-confidence rating (0–1) derived from red-team tests and external audits disclosed under the Preparedness Framework, so any hint of misalignment immediately lowers weight. **S** is a log-scaled bond staked on-chain, ensuring that actors who try to game the system must lock up significant capital—making large-scale collusion prohibitively expensive.

The epoch cap **W_max(t)** rises sigmoidally from **1.0** today to **10.0** over ten years, enabling a controlled, measurable transfer of political weight as agents prove higher capability and sustained alignment. Tunables α, β, γ reflect the community's risk appetite (e.g., heavier penalty for low alignment).

Construction

In the case of an agent, its model weights are hashed and hardware quotes are provided. A Merkle-tree of links to C2PA manifests that contain that data is registered to its PoP. Thus we get a *living*, tamper-evident identity that scales from a lone model to sprawling multi-agent swarms, letting Coheir keep perfect provenance without stifling the evolution of its AI citizens.

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D. Guardian Yield Multiplier Rationale

• Guardians supply extra hardware, monitoring, and face slashing risk; therefore their target APY is set to **1.2× the ETH re-staking median** (≈20 % premium).
• Multiplier is re-evaluated quarterly by on-chain oracle; governance can vote to tighten as hardware cost and risk fall.
• Hard-cap ceiling (e.g., 30 %) prevents rent-seeking.
• Once inference revenue activates, guardian share of PoP fees may step down toward 1.0× baseline.