

SCDO Laboratory · TECH PR · UNIT 11

Automated Contract Ledgers for AI Agents · Next-Gen Smart Payments

Mining 101: Hashpower, Rewards, Nodes

From proof-of-work to joining the network · Ying Willam Zhang · 2026

Disclaimer: This primer is for education only — not investment, legal, or tax advice.

11. Mining: PoW, miners/pools, GPU/ASIC, and SCDO bookkeeping

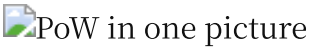
> SCDO Lab · Web3 Primer v2 · English · Chinese: `11-mining.md`
> After Ch. 4 shards and Ch. 10 SCDO: PoW basics, miners/pools, hardware paths, and **SCDO’ s two mining tracks** (Shard0 Ethash + Classic S1–4 ZPoW).
> Education only — not investment advice. No entertainment promo.

What is mining (PoW)?

Proof of Work makes nodes compete on a verifiable puzzle; winners produce blocks and earn rewards/fees (rules vary). Mining trades **energy and hardware** for block rights and incentives, and makes rewriting history expensive.

Think of an open-book exam: the answer is hard to guess by chance, but easy for everyone to check. Whoever submits a valid solution first temporarily wins the right to append the next page of the ledger—and collects the rule-defined reward.

PoW is not the only consensus family (Ch. 3 covered PoS and others), but it remains the security story Bitcoin opened and many shard networks still use: **attacks are expensive; verification is cheap**.



Difficulty, block time, halving intuition

- **Difficulty** retargets so block intervals stay near a goal (Bitcoin ~10 minutes; SCDO Shard0 targets on the order of ~13s—check live chain params).
- **More hashrate → higher difficulty**: the same rig can earn less over time.
- **Halving / reward decay**: never extrapolate old screenshots into a business plan.

Miners, full nodes, pools

Role	Job	Cost / risk
Full / bookkeeping node	Hold state, verify, may produce blocks	Disk, bandwidth, ops
Miner	Search PoW solutions at target difficulty	Power, hardware wear, heat/noise

Role	Job	Cost / risk
Pool	Aggregate hashrate; pay by shares	Fees, rules, centralization

Pools cut luck volatility and add **centralization and rule trust**—check fees, payouts, switchability, history, algorithm support, and address formats.



Reading hashrate share

If public materials show large project-operated hashrate, treat that as a **decentralization risk indicator**, not instant conspiracy. Independent bookkeepers, verifiable software, and transparent rules help. Education: treat distribution as a health check, not a “house always wins” ad.

GPU, CPU, ASIC

- **CPU:** flexible; some scientific-style algorithms.
- **GPU:** workhorse for Ethash-family and many PoWs.
- **ASIC:** algorithm-specific efficiency; prices out casual hardware.

Algorithm choice shapes who can mine: **ZPoW** vs **Ethash** imply different hardware ecosystems. Before buying cards ask: which chain, which algorithm, which official miner builds?



Power, cooling, premises

1. Price local kWh honestly.
2. Noise and leases can forbid mining outright.
3. Fans, PSUs, and GPUs are consumables.
4. Verify miner software hashes; avoid “cracked optimizers.”

Costs, risks, honest expectations

Losses happen. Price, difficulty, pool fees, and resale value can erase margins. Policy varies by place. This book offers **no guaranteed rig list** and does not teach how to evade energy or tax rules.



SCDO track A: Shard0 Ethash

- Shard0 EVM · Ethash · chainId **5680**.
- Tooling resembles Ethereum-PoW-era GPU stacks; follow official guides.
- Addresses are `0x…`; payouts must match EVM wallets.
- Project hashrate may be large—independent bookkeepers help (per disclosure).

Suggested order: read docs → confirm address format → small hashrate trial → scale.


Shard0 Ethash mining

SCDO track B: Classic Shards 1–4 ZPoW

- Four Classic shards; **ZPoW** consensus.
- Address/wallet paths differ (`1S…` vs `0x…`).
- GPUs common; wallet CPU bookkeeping may exist—per then-current docs.
- Know which shard your payout address lives on.


Classic ZPoW mining

Two-track cheat sheet

Item	Shard0	Classic S1–4
Consensus	Ethash PoW	ZPoW
Tooling intuition	Ethereum-like GPU/EVM	go-scdo ecosystem
Address	`0x…`	`1S…`
Agent Ledger	Contract anchoring home	Core shard value transfer
First question	Is chainId 5680?	Is the address Classic?

Pool terms: five things to read

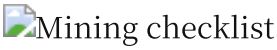
1. Fee %. 2. Minimum payout and schedule. 3. Algorithm and stratum ports. 4. Payout asset and address format. 5. Operator history and governance.

Security side channels

Mine on machines that do not hold exchange sessions or large seed phrases. Lock down remote admin. Electrical safety is personal safety, not only asset safety.

Newcomer checklist

1. Know chain and algorithm.
2. Price power and noise; ignore hype screenshots.
3. Triple-check payout addresses; use trusted pools.
4. Verify miner software hashes.
5. Separate experiment rigs from savings wallets.
6. Watch public hashrate disclosure and rule changes.
7. Obey local law and lease/grid constraints.


Mining checklist

Relation to agents and payments

Mining earns block rewards/fees; **Agent Ledger** records agent work and settlement receipts. Do not merge “mining dashboard” and “agent heartbeat” into one product story.

Chapter wrap

PoW = verifiable compute race; pools trade variance for trust points; hardware follows algorithms. SCDO: **Shard0 Ethash EVM track** + **Classic S1–4 ZPoW shard track**. Next: bots and payments.

(Chapter 11 · Mining · SCDO Lab · expanded 2026-10-30)