Sneaky Blockchain

Power Cost Comparison

For Managers

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Introduction

Blockchain platforms often use large amounts of electricity. Sneaky is different. Sneaky is simple, efficient, and uses much less power. This document compares Sneaky's power use with Bitcoin, Ethereum, and Ethereum 2.

Energy Use

- **Bitcoin**
  Bitcoin uses Proof-of-Work (PoW). PoW is notoriously energy-intensive. Bitcoin consumes ~110 TWh annually. This is similar to the energy used by a country like Argentina[1].
- **Ethereum (Pre-Merge)**
  Ethereum used PoW before moving to Proof-of-Stake (PoS). It consumed ~80 TWh annually[2].
- **Ethereum 2 (Post-Merge)**
  Ethereum 2 now uses PoS. This cut its energy use to ~0.1 TWh annually[3]. This is as much as a small town.
- **Sneaky**
  Sneaky does not use PoW or PoS. Sneaky uses a clock-synchronous model where proofs are derived mathematically[4].

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[1] Cambridge Bitcoin Electricity Consumption Index. Bitcoin's annual energy consumption: ~110 TWh. Website: https://ccaf.io/cbeci/index
[2] Digiconomist Ethereum Energy Consumption Index. Ethereum pre-merge annual consumption: ~80 TWh. Website: https://digiconomist.net/ethereum-energy-consumption
[3] Ethereum Foundation Blog. Post-Merge Ethereum energy use reduced to ~0.1 TWh annually. Website: https://blog.ethereum.org/2022/09/15/mainnet-merge
[4] Sneaky White Paper. Available at: https://github.com/grouchojones/SneakyB/blob/main/Sneaky%20White%20Paper.pdf. Also see the appendix.

Its nodes consume ~30–40 watts each, typical for small Azure instances[5]. A Sneaky chain requires only three worker nodes and one clock node to operate securely. A 4-node Sneaky chain consumes less than ~0.44 MWh annually, about as much as a single household.

Energy Costs

Blockchain	Energy per Node	Annual Cost per Node	Total Use (TWh)
Bitcoin	~3,250 W	~$2,847	~110
Ethereum	~1,250 W	~$1,095	~80
Ethereum 2	~150 W	~$131	~0.1
Sneaky	~40 W	~$35	~0.0014

Environmental Impact[6]

- Bitcoin produces ~70 million tonnes of CO2 annually.
- Ethereum (Pre-Merge) produces ~50 million tonnes of CO2 annually.
- Ethereum 2 produces ~100,000 tonnes of CO2 annually.
- One Sneaky instance produces ~0.1 tonnes of CO2 annually. To be clear, this must be multiplied by the number of customer chains to provide the total cost for the product.

Social and Business Implications

High energy consumption has been a significant barrier to blockchain adoption, particularly for applications like NFTs with limited industrial use. Sneaky fundamentally changes this dynamic by:

- Dramatically reducing environmental costs

[5] Microsoft Azure Pricing and Performance Documentation. Node energy consumption based on Azure B2s instances. Website: https://azure.microsoft.com/en-us/pricing/details/virtual-machines/linux

[6] Carbon emissions are calculated based on the global average CO2 emission rate of ~0.233 metric tons per MWh. Source: International Energy Agency (IEA). Global CO2 Emissions in 2022. Available at: https://www.iea.org/reports/global-co2-emissions-in-2022

- Enabling new blockchain use cases
- Providing an eco-friendly technological solution

Conclusion

Sneaky delivers blockchain security and functionality at a fraction of traditional energy costs. It represents an affordable, sustainable approach to distributed ledger technology.

Appendix – Clock Synchronisation

Sneaky uses a unique clock node as its central mechanism for blockchain coordination. Unlike traditional blockchains that rely on complex consensus mechanisms, Sneaky simplifies transaction ordering through a single authoritative clock node. This clock node acts as the blockchain's timekeeper and central verification point.

The clock node performs three critical functions. First, it receives completed blocks from worker nodes. Second, it validates each block's integrity and compliance with blockchain rules. Third, it adds a precise timestamp and digital signature to each block. These signatures establish the block's permanent position in the chain and seal its authenticity.

The clock can be hosted by the chain owner [meaning a Sneaky chain must have four or more nodes] or a chain may use the Sneaky central clock hosted by SneakyLabs [meaning the chain may have as few as three nodes].

Every transaction goes through a clear verification process. The clock checks the worker's signature using the worker's public key from the blockchain. It then examines each transaction's sender signature. This approach eliminates the need for energy-intensive consensus mechanisms like Proof-of-Work or Proof-of-Stake. Instead, Sneaky relies on cryptographic proofs and a centralized clock to maintain blockchain security and consistency.

The clock node maintains a registry of workers and tracks their status. It monitors node activity, manages timeouts, and controls worker states. If a worker becomes inactive, the clock initiates a ping sequence to verify the node's status. This centralized approach ensures network reliability while keeping the system simple and efficient.

The clock's design supports Sneaky's core principles: simplicity, security, and minimal resource use. By centralizing critical blockchain functions in a single node, Sneaky dramatically reduces the computational and energy overhead of traditional platforms.

References

Bitcoin

Source: Cambridge Bitcoin Electricity Consumption Index (CBECI)
Bitcoin’s annual energy consumption is estimated at ~110 TWh.
Website: https://ccaf.io/cbeci/index

Ethereum (Pre-Merge)

Source: Digiconomist Ethereum Energy Consumption Index
Ethereum’s pre-merge annual consumption was ~80 TWh.
Website: https://digiconomist.net/ethereum-energy-consumption

Ethereum 2 (Post-Merge)

Source: Ethereum Foundation
Post-Merge Ethereum (Proof-of-Stake) energy usage dropped by ~99.95% to ~0.1 TWh annually.
Website: https://blog.ethereum.org/2022/09/15/mainnet-merge

Sneaky

Estimate based on Azure App Services and node specifications:
Node energy consumption is approximately 30–40 W, typical for small cloud instances like Azure B2s.

Website: https://azure.microsoft.com/en-us/pricing/details/virtual-machines/linux

For further details, refer to the Sneaky White Paper. Available at: https://github.com/grouchojones/SneakyB/blob/main/Sneaky%20White%20Paper.pdf