

# Cryptocurrencies use massive amounts of power, but eco-friendly alternatives come with their own risks

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Credit: Pixabay/CC0 Public Domain

As the urgency of climate change ramps up, focus is increasing on digital currencies to address their environmental impact.

According to industry forecasts, the global cryptocurrency market is expected to surge to [US\\$4.94 billion by 2030](#). But the process of mining digital currencies such as [Bitcoin](#) requires immense computational power—causing a significant drain on [energy resources](#).

"Miners" use sophisticated hardware to solve complex mathematical puzzles, securing transactions and minting new coins. But this process, known as "proof of work" ([PoW](#)), is energy intensive.

Imagine a giant lock with a million combinations. Miners are all competing to find the right combination to unlock the block (a group of transactions) and earn rewards. The more computing power you have, the faster you can try different combinations.

But this computing power requires a lot of energy, similar to how a powerful car uses more petrol. So, miners are using a massive amount of electricity to run super-powered computers 24/7.

In 2021, [police in the United Kingdom raided an industrial unit](#) under suspicion it was housing an indoor marijuana growing operation. They were surprised to discover instead an extensive Bitcoin mining setup which was illegally siphoning electricity from a mains supply.

In 2021, Bitcoin mining consumed enough energy to rank 27th among nations, ahead of Pakistan with a population of over 230 million people. Just a year later, Bitcoin's energy usage [surpassed Finland's national power consumption](#).

[Alternatives have emerged](#) to address the rampant energy consumption of cryptocurrency mining. But the question is, are these green currencies a viable alternative to the traditional options?

## **The emergence of green cryptocurrencies**

Green cryptocurrencies use a less energy-intensive process known as "proof of stake" ([PoS](#)). Instead of needing a powerful computer, miners need to have a certain amount of the relevant cryptocurrency—kind of like a deposit.

If someone tries to cheat or mess with the system, they could lose some of their own cryptocurrency. This "skin in the game" keeps validators—those validating and verifying transactions—honest and secure.

A pivotal moment for those interested in green alternatives was cryptocurrency Ethereum's [migration to PoS](#) in September 2022, through an update dubbed "The Merge".

This shift led to a 99.9% drop in Ethereum's energy use. Before the transition, Ethereum's energy consumption was on par with Switzerland. Post-merge, its power usage was [closer to that of a small town](#).

## Challenges and the road ahead

In addition to Ethereum, several other cryptocurrencies are making significant strides in the realm of green finance. Notably, [Cardano and Solana are gaining ground](#) in the crypto market. They use significantly less energy, can handle larger numbers of transactions without slowing down, and claim to be secure.

Despite the benefits, the shift to green cryptocurrencies is fraught with challenges. Some users worry [PoS might be less secure than PoW](#). And those with more coins have a higher chance of validating transactions. This could lead to a situation where [a few people control the network](#).

Moreover, the initial distribution of coins in cryptocurrencies using PoS

can be less democratic, often benefiting early adopters.

As a result, [early adopters](#) who accumulate a large number of coins can have a disproportionate influence on the network. This can be seen as less democratic because it gives more power to the wealthy, which goes against the [decentralized ethos of cryptocurrencies](#).

## Evolution of green currencies continues

PoS is not the only change attempting to address cryptocurrencies' energy consumption. [Sharding](#) is another.

Sharding divides the network into smaller sections called "shards", each handling its own set of transactions. This frees up individual computers on the network (called nodes) from processing everything at once, leading to significantly faster [transaction](#) speeds and lower costs.

This innovation goes beyond just efficiency. Sharding's parallel processing approach minimizes energy needs, potentially making cryptocurrencies more eco-friendly.

Ethereum's upcoming upgrade, [Ethereum 2.0](#), incorporates sharding to address the network's current limitations on speed and transaction fees. By implementing sharding in phases, developers hope to ensure a smooth transition while maintaining the network's security and decentralization.

While sharding seems like a game-changer, it's not without its own hurdles. Implementing it effectively requires careful planning and rigorous testing to safeguard the network's integrity.

Overall, sharding offers a glimpse into a future where cryptocurrencies can process transactions faster, become more cost-effective and even reduce their environmental impact.

Green cryptocurrencies show how technology and finance can support ecological sustainability, providing a model for others to follow. But there is always a risk. And as they develop, green cryptocurrencies need to address concerns over security, network integrity and accessibility.

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