

A Failing Grade in Green: Blockchain Considerations for a Sustainable Planet

EARTH DAY 2022



In the past 24 hours over [1.2 million transactions](#) were executed across Ethereum producing approximately [147 kilograms of CO₂](#) per transaction – an annual carbon footprint on par with that of Singapore. If Bitcoin and Ethereum were a country, their combined energy consumption would be [12th highest in the world](#).

Ethereum (with its energy-intensive Proof-of-Work consensus mechanism) commands the largest market share of blockchain settlements by far, with over [50% of Total Value Locked](#) in addition to [76% of the dollar volume traded](#) on the top 4 NFT blockchains. Yet, the Web3 economy is rapidly evolving and still very much in its nascent stages, and competitors to Ethereum have emerged. These alternatives seek to improve upon the current state of Ethereum's weak performance and massive environmental impact with new Layer-1 blockchains (e.g. Solana) or Layer-2 Ethereum sidechains (e.g. Polygon). They make promises about their own energy and environmental footprint being just a [tiny fraction](#) compared to that of Ethereum (citing their use of a Proof-of-Stake vs. Proof-of-Work consensus mechanism for validating blockchain transactions).

As an example, the Polygon Layer-2 Ethereum sidechain effectively adds carpool lanes to the proverbial ["Ethereum highway"](#) and has demonstrated to be less than desirable for environmental watchdogs. This misconception became particularly evident after the WWF announced [incorrectly](#) that their NFTs running on Polygon were only producing 0.207 grams of CO₂, but, in fact, were estimated to be closer to [2,100x CO₂ more per transaction](#) (430 grams).

Solana, one of the alternatives to Ethereum and one of the most active Proof-of-Stake blockchains, has looked to improve on incumbent systems and promise low power consumption per transaction. Similarly

disappointing, Solana has been revealed to emit [934 tons of CO₂ equivalent per year](#) due to energy consumption of its network's massive usage from the requirements of its hardware (nodes).

With alternative blockchain companies competing to marginally improve upon Ethereum's highly carbon-intensive Proof-of-Work consensus, Ethereum itself is in the process of changing its consensus algorithm to a Proof-of-Stake model, which it estimates would [reduce its energy consumption by 99.95%](#) in the highly anticipated Ethereum 2.0 merge. Yet, [a recent academic study on blockchain energy footprints](#) found that even the improved Ethereum 2.0 would still rank as one of the *least energy efficient blockchains* amongst its closest peers and by a wide margin.

[The Žetonium blockchain](#) used by Personal Digital Spaces (PDS) offers a "breath of fresh air". It affords greater functionality than the aforementioned blockchains with a negligible carbon footprint. Running a fully deployed Žetonium node consumes less energy than a 60W light bulb, and executing one transaction produces less carbon than sending a single email. And, while other blockchains are constantly running at full throttle regardless of usage, Žetonium nodes are optimized for reduced computing and energy consumption, much like a car that automatically pauses its engine at a stoplight or idles when not fully engaged.

This 2022 Earth Day, occurring in the nascency of this newly emerging information economy, should be the time to evaluate the environmental impact of blockchain choice, including the individual choices of those buying, selling and creating information economy assets on blockchains that are churning through energy and emitting carbon on the scale of nations. Especially, as the Žetonium Blockchain demonstrates, when it is entirely unnecessary compared to alternatives.

About Personal Digital Spaces (PDS): Personal Digital Spaces (PDS) provides an enterprise-grade, blockchain-enabled API platform for building applications and marketplaces that can license and monetize digital content and services. Founded by proven technology and policy leaders, the PDS platform, its APIs and business model are all designed to enable rapid development and deployment, industry-leading performance and predictable, low-cost transactions on a global scale. PDS fosters responsible, real-time management of digital property rights toward a [Sustainable Information Economy](#) where all can thrive. For more on Personal Digital Spaces (PDS), visit: <https://www.personaldigitalspaces.com/>.

About The Žetonium Project: Žetonium uses a novel, energy-efficient consensus mechanism, "Proof-of-Loyalty" (PoL). Rather than rewarding centralized energy consumption (as with PoW), Žetonium rewards usage of the network. The Žetonium Project believes that those who use the network the most should ensure the network's security, as well as get rewarded for it. For more on The Žetonium Project, visit: <https://www.zetonium.io/>.