

Bitcoin compared to what? New index shows energy consumption

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Bitcoin has landed front and center in the ongoing debate over benefits of cryptocurrencies and impact on the environment.

Numerous headlines this month carry stark comparisons and to distill them all: "Bitcoin uses about as much energy as Switzerland."

Bitcoin is using around seven gigawatts of electricity, equal to 0.21% of the world's supply, according to an online tool's estimate, said BBC News. "That is as much power as would be generated by seven Dungeness [nuclear power plants](#) at once," said Chris Baraniuk, BBC News.

"That's a bit more than the entire country of Switzerland is [using](#)," said *Naked Security*, citing that online tool, which is the Cambridge Bitcoin Electricity Consumption Index (CBECI) (Switzerland, 58.46 TWh per year; Bitcoin, 58.93 TWh per year).

The Cambridge Center for Alternative Finance at Cambridge Judge Business School, University of Cambridge, launched the index. What is its purpose? It provides a real-time estimate of the total annual electricity usage of the Bitcoin network and enables live comparisons to put the numbers in perspective.

As Baraniuk explained, "the miners are more or less constantly working. The University of Cambridge tool models the economic lifetime of the world's Bitcoin miners. It uses an average electricity price per kilowatt hour (\$0.05, £0.04) and the energy [demands](#) of the Bitcoin network."

Once you can free your mind off the Switzerland perspective, here are some other comparisons delivered by the CBECI website: the current annual estimate of 50 terawatt-hours (TWh) could power all European tea kettles used to [boil](#) water for a year, or satisfy the energy needs of the University of Cambridge for 365 years.

"The tool makes it easier to see how the crypto-currency network's energy usage compares with other entities," said Baraniuk.

The index does not veer from a mission to literally put things in perspective. Looked at from a different view, "the electricity wasted

each year by always-on but inactive home devices in the United States alone could power the Bitcoin network more than four times."

CBECI wants to be a step toward a more comprehensive analysis of the environmental footprint of the cryptocurrency mining industry overall. Future plans are for an interactive geographical map of mining facilities globally. That map will provide a more accurate assessment of Bitcoin's total carbon emissions.

For those who are not yet familiar with Bitcoin (beyond hearing how popular it is as a cryptocurrency) many sites offer definitions and backgrounds. To understand why it is being tracked, JD Alois in *Crowdfund Insider* had a helpful discussion.

"Over time, the mining process has migrated away from hobbyists operating their own mining nodes to highly professional mining farms scattered around the world competing to earn free money; except the [virtual currency](#) is not really free as it costs considerable sums to operate these farms—most of it in electricity bills."

Bitcoin mining relies on computation-heavy cryptographic operations, said the CBECI site, that require significant amounts of electricity.

As a result, "Bitcoin, and those individuals and corporations that mine the crypto, have come under scrutiny and criticism for the amount of energy used in creating the [crypto](#)." As for the CBECI, *Crowdfund Insider* called it "probably the best real-time estimate of Bitcoin mining energy usage in existence."

Bitcoin basics from the University of Cambridge: Bitcoin has its own, native cryptocurrency called bitcoin (BTC)...New bitcoins are issued, according to a transparent and predictable schedule, on average every 10 minutes through a process called mining... one bitcoin can be divided out

to eight decimal places. This means that one [bitcoin](#) corresponds to 100 million satoshi, the smallest base unit.

As interesting as the CBECI launch news is, no less significant chatter resides in an article that was published in *Joule*. In "The Carbon Footprint of Bitcoin," the authors stated that "Participation in the Bitcoin blockchain [validation](#) process requires specialized hardware and vast amounts of electricity, which translates into a significant carbon footprint."

As of November last year, in a determination by the authors of the annual electricity consumption of Bitcoin, the number turned out to be 45.8 TWh with an estimated annual carbon emissions range from 22.0 to 22.9 MtCO₂.

"This means that the emissions produced by Bitcoin sit between the levels produced by the nations of Jordan and Sri Lanka, which is comparable to the level of Kansas City."

The authors acknowledged that "cryptocurrencies cause a relatively small fraction of global emissions," but, they added, "regulating this largely gambling-driven source of carbon emissions appears to be a simple means to contribute to decarbonizing the economy."

Alan Martin, *The Inquirer*, agreed with the view that the percentage is small but still deserving recognition. He wrote that although the current estimate from the site was such a small percent of the world's entire [electricity](#) consumption, it still was "an alarming [total](#) for a currency that isn't widely accepted."

Does anyone attach a proposed solution for the future of Bitcoin vis a vis the environment? In April, *Yale Environment Review* carried an article by Bruce Mecca. "Despite its considerable potential benefits, Bitcoin

mining is designed to be energy intensive. Even the verification process needed to trade Bitcoin is a polluting endeavor."

The author examined options for policy measures with final conclusions, saying that "the lack of collective international response to regulate Bitcoin is at the root of the problem. [Ultimately](#), stronger international cooperation will be necessary to 'green' Blockchain and digital currencies."

More information: www.cbeci.org/

[www.epe.admin.cam.ac.uk/cambri ... sumption-index-cbeci](http://www.epe.admin.cam.ac.uk/cambri...sumption-index-cbeci)

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