https://doi.org/10.51483/IJCCR.1.1.2021.1-4 ISSN: 2790-1386

SvedbergOpen
DISSEMINATION OF KNOWLEDGE

International Journal of Cryptocurrency Research

Publisher's Home Page: https: / / www.svedbergopen.com /

Short Communication Open Access

Cryptocurrency and Its Impact on Environment

Kamshad Mohsin[1*]

[1]Assistant Professor, Maharishi University of Information Technology, Noida, Uttar Pradesh 201304, India.
E-mail: kamshadmohsin@gmail.com

Article Info

Volume 1, Issue 1, December 2021
Received : 10 September 2021
Accepted : 19 November 2021
Published : 05 December 2021
doi: 10.51483/IJCCR.1.1.2021.1-4

Abstract

Cryptocurrencies have gone a long way since their inception. While the conventional financial sector initially dismissed digital currencies as tools for crooks and speculators, the sector has made considerable progress in establishing itself as a genuine and (possibly) world-changing arena. Many skeptics and environmentalists, in particular, have expressed worry about the energy consumption of cryptocurrency mining, which may result in increasing carbon emissions and climate change. The amount of energy that is necessary to run the algorithms on digital assets like Bitcoin have a significant environmental imprint. The environmental implications of this technology and to regulate digital currency enterprises may not only harm the environment, but may also deter future digital currencies from taking efforts to minimize their energy usage and carbon emissions.

Keywords: *Cryptocurrencies, Blockchain, Enviroment, Mining, Energy*

1. Introduction

Cryptocurrencies have gone a long way since their inception. While the conventional financial sector initially dismissed digital currencies as tools for crooks and speculators, the sector has made considerable progress in establishing itself as a genuine and (possibly) world-changing arena (What's the environmental impact of cryptocurrency? 2021). Bitcoin (BTC) and ether (ETH) have witnessed significant price and user growth, but there are still concerns about the long-term effects of widespread cryptocurrency usage. Many skeptics and environmentalists, in particular, have expressed worry about the energy consumption of cryptocurrency mining, which may result in increasing carbon emissions and climate change (What's the environmental impact of cryptocurrency? 2021). The mainstreaming of cryptocurrency, as it has been dubbed, is clearly a significant event in the world of finance. It is also a significant event in the world of, well, the globe. This is especially true in the case of Bitcoin, the original cryptocurrency, Bitcoin. Like Dogecoin, has lately increased in value. In April 2020, a coin was valued around $7,000; now, it is worth more than $55,000 (Kolbert, 2021). The potential reward from "mining" bitcoin has risen in tandem with the expense of investing in it. Bitcoin mining is, of course, totally fictitious, but the repercussions can be just as damaging as the real thing.

Whether you like cryptocurrencies or oppose them, there's no denying that bitcoin and other proof-of-work blockchains use massive amounts of energy.

* *Corresponding author: Kamshad Mohsin, Assistant Professor, Maharishi University of Information Technology, Noida, Uttar Pradesh-201304, India.* E-mail: kamshadmohsin@gmail.com

2. What is a Cryptocurrency?

The word cryptocurrency was practically unknown ten years ago, but it has now gained widespread acceptance. It refers to digital or virtual currencies that are based on cryptography and use very complicated encryption methods. These digital assets are resistant to inflation and easily portable, and are meant to be extremely secure, with almost little danger of counterfeiting.

Bitcoin is the most well-known type of cryptocurrency. Bitcoin, the first decentralized cryptocurrency, was created in 2009. The creator is known as Satoshi Nakamoto, however this is a pseudonym. In reality, the true identity of its founder is still a bit of a mystery, with numerous high-profile scientists and engineers claiming to be the brains behind the world-famous digital currency (Which cryptocurrency is the most environmentally friendly? 2021).

3. What is Bitcoin Mining?

Bitcoin mining is the mechanism through which new bitcoins enter circulation, but it is also an important component of the blockchain ledger's upkeep and evolution. It is carried out with the aid of highly advanced computers that answer incredibly complicated computational math problems.

Bitcoin mining is performed by high-powered computers that solve complex computational math problems; these problems are so complex that they cannot be solved by hand and are complicated enough to tax even incredibly powerful computers (Bitcoin Mining, 2021).

Miners are compensated for their services as auditors. They are in charge of determining the validity of Bitcoin transactions. This rule is intended to keep Bitcoin users honest. Miners assist to prevent the "double-spending problem" by confirming transactions.

A case of double spending occurs when a bitcoin owner spends the same bitcoin twice. This is not an issue with actual currency: once you hand someone a $20 bn to purchase a bottle of vodka, you no longer have it, thus there's no risk of using the same $20 bn to purchase lottery tickets next door (How does Bitcoin Mining Work? 2021)). While there is the chance of counterfeit money being produced, it is not the same as spending the same dollar twice. However, with digital money, there is a possibility that the holder may make a replica of the digital token and transmit it to a merchant or another party while keeping the original.

The outcome of bitcoin mining is dual. First, when computers on the bitcoin network solve these complicated arithmetic problems, they generate new bitcoin (not unlike when a mining operation extracts gold from the ground). Second, by solving computational math problems, bitcoin miners ensure the trustworthiness and security of the bitcoin payment network by validating transaction data.A transaction occurs when someone sends bitcoin anyplace. Banks, point-of-sale systems, and tangible receipts document transactions conducted in-store or online. Bitcoin miners accomplish the same thing by grouping transactions into "blocks" and adding them to a public record known as the "blockchain." Nodes then keep track of those blocks so that they may be confirmed in the future (Bitcoin Mining, 2021).

4. Mining Requires Energy

The competitive nature of proof-of-work blockchains has resulted in stratospheric energy expenditures. Instead of recording account balances in a central database, bitcoin transactions are recorded by a distributed network of miners who are rewarded for their efforts through block rewards. These specialized computers are in a race to record new blocks, which can only be generated by solving cryptographic puzzles.

Cryptocurrency supporters say that because it does not rely on a trusted middleman or a single point of failure, this system offers significant benefits over centralized currencies. However, mining problems need several energy-intensive computations.

5. Environmental Concerns

At first look, digital currencies may not appear to pose a significant environmental risk. However, the true effects of dealing in cryptocurrencies is finally becoming clear, and it presents a bleak picture. Elon Musk's decision to discontinue Tesla's use of bitcoin as payment has renewed examination of the cryptocurrency's environmental effects. Critics of bitcoin have long been wary of its impact on the environment. The cryptocurrency uses more energy than entire countries such as Sweden and Malaysia (CBECI, 2021).

In August 2018, a Princeton University associate professor expert in cryptocurrency testified at a hearing of the US Senate Committee on Energy and Natural Resources.The testimony said that bitcoin mining accounts for nearly

5 gigawatts—or about 1% of the world's energy use. That is slightly more than what is used by the entire state of Ohio (US Senate Committee on Energy and Natural Resources).

Because of the amount of energy necessary to run the algorithms that power digital assets like Bitcoin, they have a significant environmental imprint. While this might potentially be done using renewable energy, in practice it is not. China is a major participant in Bitcoin mining, and coal accounts for 60% of the energy it consumes.

Consider the massive magnitude of cryptocurrencies, as well as the expanding demand for Bitcoin mining, and you can understand the issue. Blockchain-based currencies currently consume as much energy as many small countries, but their popularity is growing. And as demand rises, so will the industry's energy requirements (Which cryptocurrency is the most environmentally friendly? 2021).

To understand how to compute the electrical energy necessary to run the bitcoin network, you must first understand how bitcoin is created. To begin, you must determine how many sums are performed every second in order to answer the riddles. Then calculate how much electricity is required to do each calculation.These sums are called "hashes." There are so many, you must think in terms of millions (known as megahashes) or billions (gigahashes) to make any sense of them. In early 2020, the computers on the bitcoin network were cranking out close to 120 exahashes per second (*Bitcoin News*, 2020). If this data is correct, the bitcoin network in 2020 consumes 120 gigawatts (GW) per second. This converts to about 63 terawatt-hours (TWh) per year (https://www.facebook.com/thebalancecom, 2020).

One big source of concern among environmentalists is that when the price of bitcoin rises, mining becomes less efficient. In the case of bitcoin, the mathematical problems required to generate blocks become increasingly complex as the price rises, while transaction throughput remains constant. This means that as time goes on, the network will require more computer power and energy to handle the same amount of transactions.

A side from energy usage, bitcoin mining produces a large quantity of technological trash when technology becomes outdated. This is especially true for Application-Specific Integrated Circuits (ASICs) (ASIC Miner Definition., 2021), which are specialized pieces of hardware used to mine the most popular cryptocurrencies.

Unlike other types of computer hardware, these circuits cannot be reused and rapidly become outdated. Every year, the bitcoin network creates between eight and twelve thousand tons of electronic garbage, according to Digiconomist (Digiconomist, 2021).

Companies may be taxed or penalized depending on their energy use if digital currencies were deemed legitimate currencies. However, whether digital currencies are regarded actual currencies is a topic of contention among legislators and regulators. To make matters even more complicated, not all cryptocurrencies are the same or demand the same amount of energy. Some digital currencies, such as SolarCoin, may also profit.

Conclusion

The cost of bitcoin in terms of energy consumption and environmental effect is determined by how helpful it will be to society. It is difficult to judge a shifting target. The popularity of Bitcoin continues to grow, which means that more power is being employed to service more individuals in the market. It is unclear if Bitcoin mining will be worth the environmental cost in the long run.

Whether you like cryptocurrencies or oppose them, there is no denying that bitcoin and other proof-of-work blockchains use massive amounts of energy. Much of this energy is derived from the combustion of coal and other fossil fuels, however bitcoin supporters believe that renewable sources are as important.

Failure to examine the environmental implications of this technology and to regulate digital currency enterprises may not only harm the environment, but may also deter future digital currencies from taking efforts to minimize their energy usage and carbon emissions. The environmental effect of digital currencies should not be disregarded as their popularity grows.

With increased worry about the environmental effect of blockchain-based currencies, developers are looking for innovative methods to provide all of the benefits of digital currency without the large carbon imprint. Be on the lookout for a new generation of eco-friendly cryptocurrencies that employ renewable energy sources to reduce the environmental effect of transactions.

References

ASIC Miner Definition. (2021). Investopedia. https://www.investopedia.com/terms/a/asic.asp

Bitcoin Mining. (2021). Investopedia. https://www.investopedia.com/terms/b/bitcoin-mining.asp

BTC's Hashrate Touches 120 Exahash, But the Price Has Not Followed – Mining Bitcoin News. (2020, January 3). *Bitcoin News*. https://news.bitcoin.com/btcs-hashrate-touches-120-exahash-but-the-price-has-not-followed/

Cambridge Bitcoin Electricity Consumption Index (CBECI). (2021). Cbeci.org. https://cbeci.org/

Digiconomist. (2021, May 13). Bitcoin Electronic Waste Monitor – Digiconomist. Digiconomist. https://digiconomist.net/bitcoin-electronic-waste-monitor/

How Does Bitcoin Mining Work? (2021). Investopedia. https://www.investopedia.com/tech/how-does-bitcoin-mining-work/

https://www.facebook.com/thebalancecom. (2020). The Power It Takes to Create a Bitcoin. The Balance. https://www.thebalance.com/how-much-power-does-the-bitcoin-network-use-391280#citation-3

Kolbert, E. (2021, April 22). Why Bitcoin Is Bad for the Environment. The New Yorker; The New Yorker. https://www.newyorker.com/news/daily-comment/why-bitcoin-is-bad-for-the-environment

US Senate Committee on Energy and Natural Resources. Written Testimony of Arvind Narayanan at Hearing on Energy Efficiency of Blockchain and Similar Technologies. https://www.energy.senate.gov/services/files/8A1CECD1-157C-45D4-A1AB-B894E913737D

What's the Environmental Impact of Cryptocurrency? (2021). Investopedia. https://www.investopedia.com/tech/whats-environmental-impact-cryptocurrency/

Which Cryptocurrency is the Most Environmentally Friendly? (2021, April 14). TRG Datacenters. https://www.trgdatacenters.com/most-environment-friendly-cryptocurrencies/

Which Cryptocurrency is the Most Environmentally Friendly? (2021, April 14). TRG Datacenters. https://www.trgdatacenters.com/most-environment-friendly-cryptocurrencies/

Cite this article as: Kamshad Mohsin (2021). Cryptocurrency and Its Impact on Environment. *International Journal of Cryptocurrency Research*, 1(1), 1-4. doi: 10.51483/IJCCR.1.1.2021.1-4.