

# The Impact of Cryptocurrency and Its Carbon Footprint

In recent years, cryptocurrency has played an increasingly important role in the financial market. From July 2020 to June 2021, the popularity of global cryptocurrency increased by more than 880 percent.<sup>1</sup> In the future, this number will face explosive growth as well, while many environmentalists remain concerned about the trend. The reason being that the process of generating digital currency is a very energy-consuming process. It requires countless miners around the world to contribute their computing power to generate the new digital currencies and to verify the transactions of existing currencies. It is said that each Bitcoin transaction consumes 980 kilowatts, which is equivalent to three weeks of electricity for an average Canadian household.<sup>2</sup> In this process, a large amount of carbon emissions is generated, which, inevitably, has an impact on the global climate.

To understand how to save the earth by reducing carbon emissions from cryptocurrency generation, the first step is to understand how to calculate the carbon footprint associated with cryptocurrency activities. To start, it is important to identify the material sources of emissions for cryptocurrency activities. Once all the sources are identified, the amount of energy that is used needs to be quantified by collecting data from sources. Then the data are converted to carbon emissions by checking the reputable sources of emissions factors (e.g., Defra for transport, electricity and waste in the United Kingdom; the US Environmental Protection Agency [EPA]; the Higg Materials Sustainability Index [Higg MSI]<sup>3</sup> for emissions factors for materials). Based on the data collected, potential reduction opportunities can be identified.

There are many ways to help reduce carbon emissions and, thus, improve the sustainability of cryptocurrency, for example:

- Renewable resources such as wind, solar and hydropower can be used to meet production requirements and reduce carbon emissions during power generation.
- New blockchain transaction verification methods can be used to reduce energy consumption, as some large blockchain organizations are demonstrating. For example, the Ethereum Foundation, which owns Ethereum, is experimenting with a new method of transaction verification called “proof of stake” that is said to reduce the energy consumption of a single transaction by 99.95 percent.<sup>4</sup>
- The concept of carbon neutrality can be leveraged as it becomes more widely known. Carbon neutrality refers to the carbon emissions generated by human social activities, through forest carbon sinks and other technical means, to achieve zero dynamic net carbon emissions.
- Data centers can be moved to low-temperature areas with more favorable climates, allowing organizations to reduce energy consumption by reducing the demands of cooling systems in data centers.



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Although these methods have played a role in reducing carbon emissions to a certain extent, there are still more difficulties in the implementation and auditing processes. Using carbon neutrality as an example, only by calculating and quantifying carbon emissions into carbon data can the balance of carbon be clearly understood. However, the current unstandardized calculation methods cannot clarify the scope of carbon calculation measurement and the setting of criteria, which directly leads to potential regulatory risk throughout entire industries.

In response to this phenomenon, some enterprises are actively exploring an enterprise carbon measurement system and conducting regular carbon audits to prevent enterprise carbon data fraud. At the same time, many large enterprises also actively conduct carbon management and carbon information disclosure. It is estimated that the market size of carbon information disclosure may reach into the billions of US dollars, which also suggests that the carbon reporting audit may become a relatively new, but promising, emerging regulatory audit area in the near future.

### Conclusion

To have the best chance of avoiding a 2°C rise in global temperatures, the average global carbon

footprint needs to drop to under two tons per year by 2050.<sup>5</sup> With the rise of cryptocurrencies and concerns about their environmental impact and costs, more socially responsible enterprises and individuals must start to research and focus efforts on carbon-saving solutions to make cryptocurrency more sustainable from an environmental perspective. Some solutions have been identified, while more need creative thinking from collaborations between different areas, including auditing. No matter what solutions are developed, standard carbon information disclosure standards and corresponding audit frameworks and methodologies will certainly play important roles in the measurement of environment-saving efforts.

### Endnotes

- 1 Chainalysis Team, “The 2021 Global Crypto Adoption Index: Worldwide Adoption Jumps Over 880% With P2P Platforms Driving Cryptocurrency Usage in Emerging Markets,” Chainalysis, 14 October 2021, <https://blog.chainalysis.com/reports/2021-global-crypto-adoption-index/>
- 2 United Nations, “Sustainability Solution or Climate Calamity? The Dangers and Promise of Cryptocurrency Technology,” 20 June 2021, <https://news.un.org/en/story/2021/06/1094362>
- 3 Higg Materials Sustainability Index (Higg MSI), <https://portal.higg.org/>
- 4 Lau, Y.; “Ethereum Founder Vitalik Buterin Says Long-Awaited Shift to ‘Proof-of-Stake’ Could Solve Environmental Woes,” *Fortune*, 27 May 2021, <https://fortune.com/2021/05/27/ethereum-founder-vitalik-buterin-proof-of-stake-environment-carbon/>
- 5 The Nature Conservancy, Calculate Your Carbon Footprint, USA, 2022, <https://www.nature.org/en-us/get-involved/how-to-help/carbon-footprint-calculator/>