

Policy Brief

Assessing sustainability of cryptocurrencies needs to go beyond energy use and greenhouse gas emissions

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The policy problem

Cryptocurrencies have followed an unparalleled rise in market capitalization over the past years. While Bitcoin, the largest currency with a market cap of \$600bn, is particularly known for its energy intensity and associated carbon footprint, no procedure has yet been established on how to allocate the carbon footprint of any cryptocurrency to investors. Additionally, limited attention has been paid to social and governance factors of cryptocurrencies. As environmental, social and governance (ESG) become pivotal factors in financial markets, investors and policymakers require transparency to assess the sustainability as well as resilience to transition and regulatory shocks.

The findings

Environmental impacts of Bitcoin are well documented and are estimated at 90.2 Mt CO₂ annually for the entire network. If broken down to single investment holdings, we find that Tesla's Bitcoin investment, for instance, which received lots of media attention and was worth \$1.5bn in the beginning of 2021, should receive a share of 0.24 Mt CO₂ annually (see Figure). Beyond emissions, Bitcoin miners use considerable quantities of highly specialized and short-lived hardware which is made of aluminum, copper, iron, and rare earths.

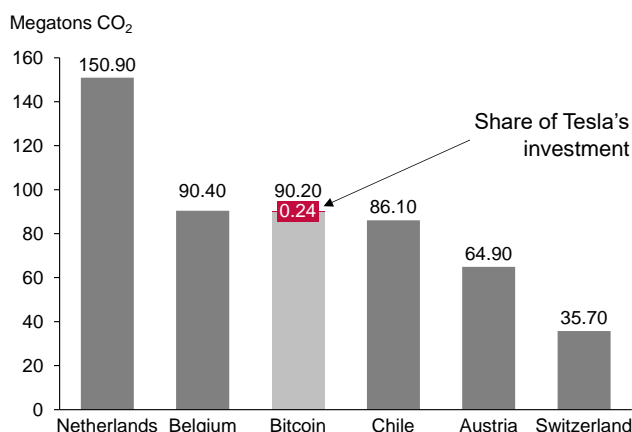


Figure: Comparison of Bitcoin's carbon footprint to national annual CO₂ emissions in 2018

Messages for policy

- Carbon emissions of cryptocurrencies are well documented, but limited attention has been paid to social and governance aspects
- Beside environmental impacts, investments in cryptocurrencies could be exposed to significant social and governance risks
- Investors and policy makers should adopt a more holistic perspective when considering external impacts of cryptocurrency investments

Social and governance aspects of Bitcoin have only recently gained attention. Social aspects relevant to Bitcoin range from societal security, labor practices, equality, to health impacts. Recent power outages, for instance in Tehran and Sukhumi, point to Bitcoin's impact on grid stability and highlight its potential to affect local communities. Concurrently governance aspects such as risks from opaque mining activities, concentration of power, negative indirect economic impacts, and issues of tax evasion could arise. For instance, Bitcoin was originally conceived as a highly decentralized network, however, at present a small number of privately owned mining pools control majority of the network. This may endanger competition and prove it difficult to make changes and improvements to the algorithm of the network which are not in the interest of this majority.

Our study

This is a commentary piece based on recent empirical studies of the carbon footprint of cryptocurrencies as well as market observations of other ESG components. This perspective provides a starting point to take a more holistic approach towards exposure of cryptocurrencies to ESG risks.

Link to the full article, and related work at

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