GREENPEACE Briefing

Financial Institutions Need to Support a Code Change to Cleanup Bitcoin

Introduction

"Humanity is on thin ice — and that ice is melting fast…Our world needs climate action on all fronts — everything, everywhere, all at once."

- *United Nations Secretary-General Antonio Guterres March 2023*[1]

The impacts of our climate crisis are growing every day. The fossil fuel industry continues to threaten lives and livelihoods, from families in Florida struggling to rebuild after Hurricane Ian to farmers in Central America displaced by drought to children living near coal-fired power plants suffering from asthma.[2] Our society needs rapid decarbonization to avert accelerating climate change damage. According to the International Energy Association, achieving net-zero emissions by 2050 is necessary for limiting global temperature rise to 1.5 C, which requires no more investments in fossil fuel supplies and rapid growth of renewable energy.[3]

Perhaps surprisingly, Bitcoin has become a substantial and growing barrier to slashing carbon emissions and phasing out fossil fuels. Bitcoin's consensus mechanism or validating transactions on its digital ledger or blockchain consumes massive amounts of electricity from fossil fuels. Globally, its **largest single source of electricity is coal-fired power plants.**[4] The digital "mining" involved in maintaining Bitcoin is now emitting more greenhouse gas emissions than many small and mid-sized countries.[5]

The financial industry is critical to all aspects of Bitcoin – from financing large digital "mining" companies, facilitating conversions to and from fiat currencies, and making the technology more accessible and widely adopted.[6] Financial companies in various sectors are boosting their crypto and Bitcoin business, despite pledges to reduce climate emissions and increase corporate sustainability. **Banks, asset managers, and payment processing companies need to take responsibility for the climate and community impacts of Bitcoin and support a code change to solve these growing problems at a global scale.**

Bitcoin's Dirty Energy Problem

The source of Bitcoin's climate problem comes from its code. Here is how it works. Bitcoin is a digital cryptocurrency that operates outside of a central bank or government by using a decentralized and collectively-maintained database, or digital ledger, a record of all Bitcoin transactions stored on the

blockchain. The records' accuracy is protected through cryptography to prevent double counting and fraudulent transactions. This process requires a mechanism for validating transactions. Bitcoin does this through “Proof of Work” – meaning users must show they are committed to protecting the system's integrity by putting in work, and thereby consuming electricity.[7]

The “work” is like a massive guessing game in which specialized computers, called ASICs (Application Specific Integrated Circuits), race against one another to guess the right answer to an algorithm. The computers act like random number generators, and those with more computing power can guess more numbers in less time, increasing their chances of picking the correct number. The winner gets to validate a new set, or “block,” of Bitcoin transactions added to the blockchain, and is rewarded with newly “mined” Bitcoin and fees.[8]

Speed demands large amounts of energy to power warehouses full of computers. Bitcoin mining is estimated to use more electricity than some entire countries, including what the Philippines and the Netherlands consumed in 2020.[9] In the U.S., the seven largest crypto mining companies use the same amount of electricity needed to power every residence in Houston, with a population of 2.3 million people.[10]

Bitcoin mining is estimated to use more electricity than Netherlands

The amount of electricity will only increase; as more miners join the competition and computers become faster, Bitcoin’s system automatically adjusts making it more difficult to guess the right number, thus requiring even more computing power and electricity.[11] In 2014 the electricity to mine a single Bitcoin was equal to what an average U.S. household used in 275 days but by 2022 that skyrocketed to around nine years.[12]

The cheaper the energy source, the more profit for the miners. Thus, miners have an incentive to seek cheap energy, which often means polluting fossil fuels like coal power. Researchers at Cambridge University estimate that 62% of the electricity used for Bitcoin mining globally in 2022 came from fossil fuels, with the most from coal and only 26% from renewables.[13] Bitcoin mining companies have even reopened mothballed coal-fired power plants in the U.S.[14] The world needs to speed up the transition away from coal, not bring more coal power online.[15] **The dirty energy powering the Bitcoin mining industry in 2021 produced around 65.4 MtCO2 annually, comparable to country-level emissions from Greece.**[16] And Bitcoin's carbon footprint has only grown over time. Researchers estimate that in 2021, a single mined Bitcoin was responsible for emitting 126 times the CO2 as a Bitcoin mined in 2016.[17]

The environmental damages from Bitcoin go beyond the GHG emissions. Communities living near Bitcoin mining facilities face an array of negative impacts from air, water, and noise pollution. Stronghold Digital Mining, a company in which Fidelity Investments holds stocks, has purchased

several waste-coal-fired power plants in Pennsylvania.[18] Waste coal is one of the dirtiest forms of energy. Nearby residents are exposed to hazardous air pollution including sulfur dioxide and nitrogen, and safety risks from large trucks carrying waste coal on small country roads to the plant.[19] Communities across the U.S. living near Bitcoin mines have also complained about the constant noise from the 24-hour operations.[20] **One person living near a mining facility in Limestone, Tennessee, described the noise as "like a jet engine idling on a nearby tarmac."**[21] Water pollution can come from water withdrawal and discharge for power plant operations and cooling mining facilities, solid waste from burning fossil fuels, and land use changes from the construction of these industrial operations.[22]

The thousands of specialized Bitcoin mining computers only last a short time, and quickly become obsolete and turn into e-waste. Data is incomplete, but one estimate suggests Bitcoin mining generates roughly 45.51 kt of e-waste in a year, equivalent to the IT waste generated by the Netherlands.[23]

Ties Between Big Finance and Polluting Bitcoin

While Bitcoin began as an alternative to traditional banking, it has become increasingly interconnected with the mainstream financial sector, which is helping grow Bitcoin and, in turn, its environmental damages. **Some of the world's largest banks, asset managers, and payment processing companies are creating new crypto-related services and platforms, and funding Bitcoin mining companies – all of which impact the climate crisis.**

Many different financial sectors are getting into cryptocurrency and providing services, capital, and expertise vital to Bitcoin's expansion. Asset managers like Fidelity Investments control funds that own stock in Bitcoin mining companies and offer investment products that let institutional and retail customers bet on the price of Bitcoin.[24] Banks, such as Goldman Sachs and JP Morgan Chase, are creating new opportunities for clients to invest in Bitcoin and the crypto sector, doing research and consulting on cryptocurrency, and directly investing in Bitcoin miners.[25] Banks also provide vital services for cryptocurrency companies, like exchanges, to conduct daily operations, and move Bitcoin back and forth between U.S. Dollars.[26] Meanwhile payment processing companies are making it easier to use Bitcoin for everyday transactions and partnering with crypto exchange companies to offer debit and credit cards that use Bitcoin.[27]

While these large financial services companies have made pledges to reduce their carbon emissions, they continue to invest in carbon-intensive Bitcoin. Many banks, asset managers, and payment processing companies have supported the goals of the Paris Climate Agreement and made net-zero emissions pledges, joining global initiatives like the United Nations Net-Zero Banking Alliance, the United Nations Net-Zero Asset Owner Alliance, and the Glasgow Financial Alliance for Net-Zero.[28] Yet

these **companies continue to invest in Bitcoin and have largely failed to report their Bitcoin-related emissions.**

Companies know there is a problem. In 2017, Mastercard stated in its Corporate Sustainability Report that "new research shows that cryptocurrencies like Bitcoin are inherently more energy-intensive than Mastercard's payment network."[29] Yet Bitcoin's decentralized nature seems to have distributed responsibility for its impacts. Without traditional leadership, Bitcoin's future depends on its users and stakeholders to guide its future. To date leaders in the financial industry have yet to acknowledge responsibility for the problem or taken meaningful steps to push for a code change that would clean up Bitcoin's climate impacts. **As the climate crisis worsens and Bitcoin's appetite for electricity continues to grow, so will the pressure on financial firms tied to Bitcoin to address its impacts.**

Fidelity Investments

Our research finds that Fidelity Investments, the fourth largest asset manager in the world, is making a big splash into Bitcoin and leading the way for the financial industry.[30] Fidelity was an early adopter of cryptocurrencies with a foray into Bitcoin mining in 2014 under the leadership of the new CEO Abigail Johnson, who is positioning the company to be a leader in cryptocurrency.[31] Fidelity now offers many ways for institutional, private, and retail customers to invest in Bitcoin, and is using its brand and reputation to instill a sense of trust in volatile and polluting Bitcoin.

The company started a unit, Fidelity Digital Assets, in 2018 to focus on crypto investments and services.[32] The unit began by offering crypto trading and custody – taking responsibility for securely storing investors' digital assets – for institutions. In March 2023, the company launched its own Bitcoin trading and custody program for retail customers called "Fidelity Crypto."[33] This move marks the first time a major financial institution got involved in directly trading cryptocurrencies and could compete with exchanges run by crypto-focused companies like Coinbase.[34]

In a major move that could bring Bitcoin investing to millions of Americans, the company announced in 2022 that employers with Fidelity 401(k) retirement plans now have an option to let their employees direct a portion of savings into Bitcoin.[35] This decision sparked widespread concern from regulators and policy-makers. The Department of Labor issued guidance suggesting 401(k) plans avoid speculative and volatile crypto investments.[36]

Through Fidelity's numerous investment funds, the company enables investing in Bitcoin and holds stock in many Bitcoin-related companies. Fidelity is the first major asset manager to create an exchange-traded fund (ETF) tied to the current price of Bitcoin, the Fidelity Advantage Bitcoin ETF (FBTC). FBTC is listed on the Toronto Stock Exchange, which lets clients indirectly invest in Bitcoin.[37] The Fidelity Crypto Industry and Digital Payments ETF (FDIG) invests in crypto-related companies.[38]

Fidelity holds stock in publicly traded Bitcoin mining companies, such as Marathon Digital Holdings, through these crypto-specific and other general market funds[39]

At the same time, Fidelity has sustainability goals and reports on environmental and climate issues. Fidelity is a signatory to the United Nations Principles for Responsible Investment and supports recommendations from the Task Force on Climate-Related Financial Disclosures. Fidelity's *2021 Environmental Report* states that the company's goal is, "to reduce our greenhouse gas emissions by expanding use of renewable energy, with a dedicated focus on reducing carbon."[40] The company's *Environmental Sustainability Statement of Intent* claims it is beginning to adopt sustainability throughout the business, including fund operations, products, risk management, and procurement.[41]

Recommendations

Big financial services companies like Fidelity need to acknowledge Bitcoin's climate pollution and other environmental impacts by taking responsibility for the problem. The financial industry is generating revenue and creating services to help grow this energy-intensive cryptocurrency. At the same time, **corporate pledges to reduce carbon emissions and sustainability plans don't include Bitcoin's climate impacts or risks.**

To help solve Bitcoin's climate problem, these companies can use financial clout and influence to incentivize a Bitcoin code change that virtually eliminates its climate impacts and aligns Bitcoin with many other and newer cryptocurrencies that use dramatically less electricity.[42] Financial companies can lead the way by convening experts, funders, and policymakers to create a clean-future for Bitcoin. Now is the time to catalyze creativity and ingenuity to design the next revolution in cryptocurrency.

Financial companies can use clout and influence to incentivize a Bitcoin code change that virtually eliminates its climate impacts

Other cryptocurrencies have also changed, like Ethereum, the second largest cryptocurrency in the world. It slashed its energy use by 99.95% by transitioning from a Proof of Work consensus mechanism to a form of Proof of Stake.[43]

Bitcoin's code has changed in the past and can be changed again to protect our climate and communities.[44] Its code is open and transparent; anyone with the requisite skills can propose code modifications. The main challenge is not technical, but social; large and small stakeholders within the Bitcoin community can champion improvements and must reach consensus on making changes.[45]

Bitcoin can thrive without energy-intensive, noisy, and polluting digital mining. Bitcoin's future growth may depend on it. The technology is still in its early years, having debuted in 2009. With the right resources, incentives, and support, new methods of securing its ledger and maintaining

decentralization can be developed and adopted. To achieve this change, financial institutions connected to the system must work with other stakeholders to change it for the better.

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