



May 4, 2022

Re: *Request for Information on the Energy and Climate Implications of Digital Assets*

To Whom It May Concern:

On behalf of the Center for American Progress, we write to comment on the Office of Science and Technology Policy's (OSTP) request for information titled *Request for Information on the Energy and Climate Implications of Digital Assets* (RFI).<sup>1</sup> The President, in an *Executive Order on Ensuring Responsible Development of Digital Assets*, tasked OSTP with developing a report that discusses, among other things, "the potential for these technologies to impede or advance efforts to tackle climate change at home and abroad[] and the impacts these technologies have on the environment."<sup>2</sup> Accordingly, our letter discusses the impacts that the use of blockchain technology in the securities and commodities markets may have on the environment, the means by which financial market regulators may incentivize the development of more energy-efficient blockchains, and how claims that blockchain technology can play a beneficial role in carbon offset markets are premature and possibly wrong.

### *A financial markets perspective on crypto assets*

With a global market capitalization of around \$2 trillion, crypto assets have become an increasingly ubiquitous presence in financial markets and the economy.<sup>3</sup> Yet there is also evidence that activities involving these assets—particularly, the process of solving a repetitive mathematical function to record new transactions known as mining, hashing, or validating—are extremely energy intensive, use significant amounts of electricity, and therefore have a large carbon footprint. By some estimates, Bitcoin alone is responsible for 0.40% of the world's electricity consumption, has a carbon footprint equal to that of Denmark or New Zealand, and in a single transaction uses more energy than 100,000 Visa transactions.<sup>4</sup> By another estimate, the carbon footprint of a single mined Bitcoin is

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<sup>1</sup> Office of Science and Technology Policy, "Notice of Request for Information on the Energy and Climate Implications of Digital Assets," *Federal Register* 87 (58) 2022: 17105-17107, available at <https://www.federalregister.gov/documents/2022/03/25/2022-06284/request-for-information-on-the-energy-and-climate-implications-of-digital-assets>.

<sup>2</sup> Executive Office of the President, "Executive Order 14067: Ensuring Responsible Development of Digital Assets," *Federal Register* 87 (49) 2022: 14143-14152, available at <https://www.federalregister.gov/documents/2022/03/14/2022-05471/ensuring-responsible-development-of-digital-assets>.

<sup>3</sup> CoinMarketCap, "Total Cryptocurrency Market Cap," available at <https://coinmarketcap.com/charts/> (last accessed April 2022).

<sup>4</sup> Alice Feng, "Is Cryptomining Harming the Environment?" Princeton Student Climate Initiative, February 27, 2021, available at <https://psci.princeton.edu/tips/2021/2/27/is-cryptomining-harming-the-environment>.

334 metric tons of carbon dioxide, while the carbon footprint of mining gold valued at the equivalent of one Bitcoin is only 16 tons of carbon dioxide.<sup>5</sup> As the RFI notes, “[t]he explosive growth of the digital asset ecosystem may contribute to greater energy use and negatively impact the climate.” We could not have said it better.

Yet at their core, blockchains are simply a new form of technology that are used to denote or transfer ownership of assets. The technology blockchains use is unique in that data are shared among the nodes of computer networks and organized as irreversible chains of blocks.<sup>6</sup> But blockchains are functionally similar to traditional databases or ledgers because their basic purpose is to store information. The novelty and innovative nature of the technology does not change the fact that assets that are stored on blockchains are the same types of assets that have always existed. When traded publicly, assets that exist on blockchains can be securities, commodities, or non-fungible tokens (NFTs).<sup>7</sup> Just as the evolution of stocks from physical pieces of paper to digitized certificates stored in computer depositories did not change the fundamental economic characteristics of the assets, the fact that a token which represents the sale of a security exists on a blockchain does not mean it should be treated any differently than traditional securities from an economic or regulatory standpoint. Accordingly, blockchains are simply electricity-inefficient means for transferring financial assets from one individual to another.

Securities and commodities markets are overseen by the Securities and Exchange Commission (SEC) and the Commodity Futures Trading Commission (CFTC), respectively. If a crypto asset on a blockchain is traded publicly—as most well-known tokens such as Bitcoin and Ethereum are—then their markets are subject to federal securities and commodities laws, which were designed by Congress to protect investors from fraud and manipulation.<sup>8</sup> For this reason, both the SEC and CFTC have, to varying degrees, engaged in enforcement actions cracking down on abusive and illegal practices exhibited by the issuers of some crypto assets.<sup>9</sup> The distinctive nature of blockchain technology did not make the law any less applicable in these cases; in fact, many if not all of the violations targeted by regulators resemble the same kinds of violations the SEC and CFTC have enforced against for decades.

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<sup>5</sup> Digiconomist, “Bitcoin Energy Consumption Index,” available at <https://digiconomist.net/bitcoin-energy-consumption> (last accessed April 2022).

<sup>6</sup> Adam Hayes, “Blockchain Explained,” Investopedia, March 5, 2022, available at <https://www.investopedia.com/terms/b/blockchain.asp>.

<sup>7</sup> Todd Phillips and Alex Thornton, “Congress Must Not Provide Statutory Carveouts for Crypto Assets,” Center for American Progress, March 1, 2022, available at <https://www.americanprogress.org/article/congress-must-not-provide-statutory-carveouts-for-crypto-assets/>.

<sup>8</sup> Ibid.

<sup>9</sup> Rick Steves, “SEC Crypto Enforcement Actions Resulted In \$1.77 Billion Fines,” Finance Feeds, May 14, 2021, available at <https://financefeeds.com/sec-crypto-enforcement-actions-resulted-1-77-billion-fines/>; Commodity Futures Trading Commission, “President’s Budget Fiscal Year 2023,” March 21, 2022, p. 16, available at [https://www.cftc.gov/sites/default/files/2022-03/CFTC\\_FY\\_2023\\_President\\_Budget\\_Report\\_032122.pdf](https://www.cftc.gov/sites/default/files/2022-03/CFTC_FY_2023_President_Budget_Report_032122.pdf).

When blockchains are used in a private or internal setting, federal securities and commodities regulators appropriately lack oversight. For example, JPMorgan Chase employs blockchain technology for its “JPM Coin,” a token that is used by parties that hold accounts with the bank to transfer money among themselves instantly.<sup>10</sup> The tokens function like stablecoins because they maintain a stable value and holders can buy and redeem them for dollars at a JPMorgan Chase bank; however, the blockchain used is private and only select customers of the bank are allowed to access the tokens.<sup>11</sup> Since this system does not involve public trading of assets, the SEC and CFTC lack authority over it.

### *Regulation of crypto securities and commodities*

As stated above, the blockchain technology underlying crypto assets simply offers a novel way to transfer tokens between parties, and the technology itself does not change the economic characteristics of the assets being traded: The SEC maintains authority over assets that are securities, whether they are traded on the blockchain or by other electronic means, and the CFTC has authority over assets that are commodities, whether they are pork bellies or Bitcoin.<sup>12</sup>

The crypto industry has recently been advocating for new legislation from Congress that would either create a new regulatory agency for crypto or make the CFTC the sole regulator for the crypto marketplace—including those assets that are currently securities.<sup>13</sup> Among other drawbacks of such an approach is that it could subject economically-equivalent activities to disparate regulatory treatments. It could create an incentive for issuers of securities to migrate to the blockchain in order to reduce regulatory burdens. But this could have significant effects in terms of energy usage: One study estimates that the average electricity footprint of non-cash transactions by the global banking system is no more than 0.4 kWh, while the average electricity footprint per Bitcoin transaction ranges

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<sup>10</sup> Eddie Mitchell, “What is JPM Coin and How Do You Buy It?” Bitcoin Market Journal, January 10, 2021, available at <https://www.bitcoinmarketjournal.com/jpm-coin/>.

<sup>11</sup> Ibid.

<sup>12</sup> Phillips and Thornton, “Congress Must Not Provide Statutory Carveouts for Crypto Assets.” “Crypto assets are simply new, digital versions of the traditional financial products and physical assets that have been regulated for generations. The U.S. Securities and Exchange Commission (SEC) can regulate securities, regardless of whether those securities are paper or traded on a blockchain; the Commodity Futures Trading Commission (CFTC) protects against fraud and market manipulation in the commodities and derivatives markets, regardless of whether those commodities are physical or digital.”

<sup>13</sup> Nikhilesh De and Cheyenne Ligon, “Coinbase Proposes US Create New Regulator to Oversee Crypto,” Coinbase, October 14, 2021, available at <https://www.coindesk.com/policy/2021/10/14/coinbase-proposes-us-create-new-regulator-to-oversee-crypto/>; Robert Schmidt and Allyson Versprille, “Crypto Platforms Ask for Rules But Have a Favorite Watchdog,” Bloomberg, March 31, 2022, available at <https://www.bloomberg.com/news/articles/2022-03-31/crypto-exchanges-want-say-in-rules-under-biden-administration>. We have argued that legislation may be necessary to provide complete regulatory authority over crypto commodity spot markets. See Phillips and Thornton, “Congress Must Not Provide Statutory Carveouts for Crypto Assets.”

from 491.4 kWh to 765.4 kWh.<sup>14</sup> Accordingly, statutes that incentivize the migration of securities transactions to blockchains could be an environmental nightmare.

*Means by which financial market regulators may incentivize the development of more energy-efficient blockchains*

While new laws for crypto assets may incentivize the transition to more power-intensive means of conducting securities transactions, existing statutes can be used to incentivize the development of more energy-efficient blockchains.

Some blockchains have indicated that they will use the more energy-efficient method of hashing called “proof of stake” instead of the more energy-intensive “proof of work.”<sup>15</sup> Notably, the blockchain Ethereum’s move to proof-of-stake could reduce its energy use by 99 percent.<sup>16</sup> These are welcome moves that could help mitigate the environmental cost of crypto mining.<sup>17</sup>

However, within the context of blockchain-based industries, the Biden administration should incentivize the creation of energy-efficient blockchains over their energy-intensive alternatives. Fortunately, the securities and commodities laws provide the legal authority.

One way that financial market regulators can play a role in incentivizing energy-efficient blockchain practices is through disclosures. Public disclosure of information about a company’s business practices is critical for the healthy functioning of financial markets and is core to the mission of the SEC.<sup>18</sup> When making decisions about purchasing securities, investors benefit significantly from publicly available information about the issuer’s business. Disclosure of information allows investors to evaluate the potential risks and rewards of investing in a given company and thereby yields better capital allocation in the market overall.<sup>19</sup>

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<sup>14</sup> Alex De Vries, “Renewable Energy Will Not Solve Bitcoin’s Sustainability Problem,” *Joule* 3 (4) (2019): 893-898, available at [https://www.cell.com/joule/fulltext/S2542-4351\(19\)30087-X](https://www.cell.com/joule/fulltext/S2542-4351(19)30087-X).

<sup>15</sup> Amy Castor, “Why Ethereum is switching to proof of stake and how it will work,” MIT Technology Review, March 4, 2022, available at <https://www.technologyreview.com/2022/03/04/1046636/ethereum-blockchain-proof-of-stake/>.

<sup>16</sup> *Ibid.*

<sup>17</sup> Other efforts to lower emissions—such as Bitcoin mining companies using renewable power to become carbon neutral—strike us as greenwashing. See Marathon Digital Holdings, “Marathon Digital Holdings Announces Bitcoin Production and Mining Operation Updates for February 2022,” Press release, March 4, 2022, available at <https://ir.marathondh.com/news-events/press-releases/detail/1278/marathon-digital-holdings-announces-bitcoin-production-and>.

<sup>18</sup> Securities and Exchange Commission, “What We Do,” available at <https://www.sec.gov/about/what-we-do> (last accessed April 2022).

<sup>19</sup> Alexandra Thornton and Tyler Gellasch, “The SEC Has Broad Authority To Require Climate and Other ESG Disclosures” (Washington: Center for American Progress, 2021), available at <https://americanprogress.org/issues/economy/reports/2021/06/10/500352/sec-broad-authority-require-climate-esg-disclosures/>.

The SEC could require issuers of crypto securities to disclose the environmental impacts of their underlying blockchains, in terms of electricity costs (and resulting greenhouse gas emissions) due to the computational power necessary to transact on the blockchain used. This type of information would allow investors to understand how energy efficient an issuer's practices are and whether added costs due to using energy-intensive blockchains could reduce potential returns on investment.<sup>20</sup> As a result of such disclosures, issuers may be incentivized to migrate to more energy efficient blockchains or mining practices to try to prevent investors concerned about the environmental impacts of and climate risks to their investments from spending their capital elsewhere.

Further, the SEC proposed in March a rule that would require all publicly traded companies to disclose climate-related risks and greenhouse gas emissions.<sup>21</sup> If finalized, this rule could have a significant impact on publicly traded firms that specialize in crypto mining as these firms will have to disclose the amount of greenhouse gas emissions they produce as a result of the electricity consumed by their computing systems.<sup>22</sup> The benefit of this is that disclosures may incentivize crypto miners who use energy-intensive processes to transfer to more efficient technologies or use renewable sources of electricity. In fact, some crypto mining firms have indicated that they support the SEC's proposed rule because it would spotlight firms that already are using more renewable sources of energy.<sup>23</sup> Market-based solutions such as enhanced transparency through disclosures offers an opportunity for federal regulators to help investors who do not want to contribute to increased GHG emissions make informed decisions about their investments.

A second way that the federal government can play a constructive role in mitigating the negative climate impacts of crypto assets is through listing standards for registered securities exchanges. Listing standards are rules for which securities issuers must abide in order to be listed for trade on a registered exchange, such as the New York Stock Exchange.<sup>24</sup> An effective, market-based method to discourage environmentally harmful mining practices would be for platforms that transact in crypto assets to only list assets that adhere to

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<sup>20</sup> Todd Phillips, "The SEC's Regulatory Role in the Digital Asset Markets" (Washington: Center for American Progress, 2021), available at <https://www.americanprogress.org/article/secs-regulatory-role-digital-asset-markets/>.

<sup>21</sup> Securities and Exchange Commission, "SEC Proposes Rules to Enhance and Standardize Climate-Related Disclosures for Investors," Press release, March 21, 2022, available at <https://www.sec.gov/news/press-release/2022-46>.

<sup>22</sup> Aoyon Ashraf, "Mining Industry Not That Worried by SEC's Proposed New Climate Reporting Rules," CoinDesk, March 23, 2022, available at <https://www.coindesk.com/business/2022/03/23/mining-industry-not-that-worried-by-secs-proposed-new-climate-reporting-rules/>.

<sup>23</sup> Casey Wagner, "Crypto Mining Company Welcomes SEC Environmental Reporting Proposal," Blockworks, April 5, 2022, available at <https://blockworks.co/crypto-mining-company-welcomes-sec-environmental-reporting-proposal/>.

<sup>24</sup> Securities and Exchange Commission, "Listing Standards," available at <https://www.sec.gov/education/smallbusiness/goingpublic/listingstandards> (last accessed April 2022); Legal Information Institute, "15 U.S.C. § 78f(b)(5)," available at <https://www.law.cornell.edu/uscode/text/15/78f> (last accessed April 2022).

environmentally sound standards—such as only using a certain amount of electricity for mining.<sup>25</sup> The SEC has statutory authority to regulate listing standards for registered securities exchanges, and could therefore require crypto securities exchanges to list only crypto securities that meet a reasonable energy efficiency standard using the information required to be disclosed above.<sup>26</sup> The CFTC maintains similar authority over commodity futures exchanges, known as designated contract markets and swap execution facilities; it could permit the listing of only crypto commodity derivatives that adhere to environmentally sound standards.<sup>27</sup>

For example, while Bitcoin requires hundreds of kilowatt-hours of energy or more per transaction, some crypto assets require less than 1 kilowatt-hour.<sup>28</sup> The SEC and CFTC could require registered exchanges to only list coins whose transactions consume energy below a determined energy-efficiency standard in terms of kilowatt-hours. Another option is to permit exchanges to only list assets that use, or agree to establish a plan to transition to, proof-of-stake mining instead of the more energy-intensive proof of work process.

Imposing listing standards would provide a strong incentive for crypto issuers to transition away from energy-intensive technology. Because listed securities are much easier for the public to trade than those that are not listed on exchanges, the potential of lost business would likely incentivize issuers to migrate to more energy-efficient technologies, which could in turn have the effect of reducing the overall carbon footprint of crypto assets.<sup>29</sup>

### *What does the blockchain have to do with carbon offsets?*

A common way that companies seek to meet net zero emissions goals—whether voluntary or because of government regulations—is through carbon offsets. Offsets are projects or activities— such as carbon capture, reforestation, and building sources of renewable energy—that reduce the level of carbon dioxide in the atmosphere that companies with net zero goals can fund (in the form of

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<sup>25</sup> Phillips, “The SEC’s Regulatory Role in the Digital Asset Markets.”

<sup>26</sup> Although no crypto trading platform is currently registered with the SEC, Chairman Gary Gensler has recently indicated that the SEC is working to ensure that crypto platforms that list crypto securities register with the agency. Gary Gensler, “Prepared Remarks of Gary Gensler On Crypto Markets, Penn Law Capital Markets Association Annual Conference,” April 4, 2022, available at <https://www.sec.gov/news/speech/gensler-remarks-crypto-markets-040422>.

<sup>27</sup> Legal Information Institute, “15 U.S.C. § 78s(c),” available at <https://www.law.cornell.edu/uscode/text/15/78s> (last accessed April 2022); Legal Information Institute, “

<sup>28</sup> Kimberly Gedeon, “The most energy-efficient cryptocurrencies — Tesla’s top picks to replace Bitcoin,” Laptop, June 1, 2021, available at <https://www.laptopmag.com/best-picks/most-energy-efficient-cryptocurrencies-the-best-picks-for-teslas-new-coin>; Ovidio Popescu, “Most Energy Efficient Cryptocurrencies,” Trality, January 9, 2022, available at <https://www.trality.com/blog/most-energy-efficient-cryptocurrencies>.

<sup>29</sup> Todd Phillips, “The SEC’s Regulatory Role in the Digital Asset Markets” (Washington: Center for American Progress, 2021), available at <https://www.americanprogress.org/article/secs-regulatory-role-digital-asset-markets/>.

purchasing credits) to cancel out additional carbon emissions they produce.<sup>30</sup> Supporters of carbon offsets claim that they are a pragmatic, market-oriented way to both achieve net zero goals and incentivize the development of sustainable projects, but critics have noted that markets are opaque and offsets may be ineffective, or worse, counterproductive, at actually reducing global carbon emissions.<sup>31</sup>

Recently, several projects have arisen in which crypto issuers purchase carbon offsets and turn them into coins on a blockchain which can be bought and sold like a commodity.<sup>32</sup> Supporters of these projects argue that migrating carbon offset markets to the blockchain help make markets more transparent and liquid. There is even some evidence to suggest that projects like KlimaDAO played a role in driving up carbon credit prices,<sup>33</sup> with the implication that these projects benefit the environment by increasing access to and demand for carbon offsets and making sustainable projects more profitable.<sup>34</sup>

However, there is not enough evidence to suggest that moving carbon markets to the blockchain has a positive effect on reducing climate emissions. Essentially, these blockchain projects are simply offering a different type of technology to serve as a database for carbon offset markets, and critically, they do not solve the fundamental problem that exists with carbon offsets: quality assurance.<sup>35</sup> Flaws in carbon offsets markets—such as inflated baselines, impermanence of projects, leakage, and the additionality problem (which refers to the fact that new sustainable projects may have been started even without the funding from a given offset credit)—are so significant that there is enough evidence to argue that demand for offsets may actually be contributing to increased global emissions,<sup>36</sup> and to the extent that energy-intensive blockchains are used to track ownership of offsets, they may actually be exacerbating the problem.

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<sup>30</sup> Angelo Gurgel, “Carbon Offsets,” MIT Climate Portal, September 11, 2020, available at <https://climate.mit.edu/explainers/carbon-offsets>.

<sup>31</sup> Ben Cushing and others, “Re: Offsets Disclosures in Climate Risk Disclosure Rule,” Sierra Club and others, February 10, 2022, available at <https://www.sierraclub.org/sites/www.sierraclub.org/files/blog/Offsets%20Disclosures%20in%20Climate%20Risk%20Disclosure%20Rule.pdf>.

<sup>32</sup> See, for example, Toucan, “About Toucan,” available at <https://toucan-protocol.notion.site/About-Toucan-68694adef18f4613a5f5b594a2d4a407> (last accessed April 2022); Moss, “Crypto’s Carbon Emissions Addressed by One River and Moss,” available at <https://moss.earth/one-river-and-moss/> (last accessed April 2022); KlimaDAO, “Welcome to KlimaDAO,” available at <https://www.klimadao.finance/> (last accessed April 2022).

<sup>33</sup> Sam Kessler, “Crypto Carbon: Can Blockchain Networks Fix Carbon Offsets?” CoinDesk, March 27, 2022, available at <https://www.coindesk.com/layer2/miningweek/2022/03/27/crypto-carbon-can-blockchain-networks-fix-carbon-offsets/>.

<sup>34</sup> KlimaDAO, “Welcome to KlimaDAO.”

<sup>35</sup> Kessler, “Crypto Carbon: Can Blockchain Networks Fix Carbon Offsets?”

<sup>36</sup> Lisa Song, “An Even More Inconvenient Truth,” ProPublica, May 22, 2019, available at <https://features.propublica.org/brazil-carbon-offsets/inconvenient-truth-carbon-credits-dont-work-deforestation-redd-acre-cambodia/>.

Worse, the process of moving carbon offsets to the blockchain may be creating perverse incentives that contribute to the problems of quality assurance and additionality. The price of “nature-based” offsets has risen from \$4.65 per ton to over \$14 over the past year, and the result is that traders looking to take advantage of price increases have begun to tokenize older and cheaper offsets known as junk credits that might not actually represent the carbon emissions they claim.<sup>37</sup> While speculators seek to capitalize on price changes—in part by purchasing derivative products that are based the price of carbon offsets—the rush to tokenize low-quality offsets could lead to unsuspecting buyers being sold credits that cannot be reasonably guaranteed to represent carbon reduction, especially if purchasers of tokenized offsets don’t know that the underlying credits are junk.<sup>38</sup> Thus, some buyers who purchase tokenized credits to offset additional pollution that they themselves create may in fact be contributing to more emissions they otherwise would have.

With carbon offset markets and crypto markets both operating currently under little oversight, these problems may continue to persist unless and until the CFTC takes a more active role in monitoring both traditional carbon offset markets and crypto commodity markets. For the present, claims that carbon offset blockchain projects will have a net positive impact on the environment lack evidence.

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Thank you again for the opportunity to comment on the RFI. We would be pleased to answer any additional questions you may have.

Sincerely,

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<sup>37</sup> Camilla Hodgson, “Carbon-linked crypto tokens alarm climate experts,” *Financial Times*, April 16, 2022, available at <https://www.ft.com/content/ed76933e-43ed-4e72-ac19-ef47a731a595>.

<sup>38</sup> Ibid.