The Blockchain Association
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Washington, D.C. 20036

May 9, 2022

Office of Science and Technology Policy
725 17th Street NW,
Washington, D.C.

Re: Notice of Request for Information on the Energy and Climate Implications of Digital Assets, Document Number 2022-06284

To Whom It May Concern:

The Blockchain Association (the "Association") submits this letter in response to the Office of Science and Technology Policy's ("OSTP") request for information titled "Notice of Request for Information on the Energy and Climate Implications of Digital Assets."[1]

The Association is a not-for-profit organization dedicated to improving the public policy environment for public blockchain networks to allow them to develop and prosper in the United States. The Association endeavors to educate policymakers, courts, law enforcement, and the public about blockchain technology and the need for regulatory clarity to allow for a more secure, competitive, and innovative digital marketplace. The Association is comprised of over 80 industry leaders who are committed to responsibly developing and supporting public blockchain networks fueled by cryptocurrencies ("crypto"). Its diverse membership reflects the wide range of this dynamic market and includes crypto exchanges, crypto miners, custodians, software developers, early-stage investors, trading firms, and others supporting the crypto ecosystem.

1. *Protocols:* Information on the climate impacts of the protocols used by digital assets. This includes the effect of cryptocurrencies' consensus mechanisms on energy usage, as well as potential mitigating measures and alternative mechanisms of consensus and the design tradeoffs those may entail. For example, many digital assets—including those that make use of smart contracts—use or are looking into less energy-intensive consensus mechanisms than "proof of work." Information is sought related to the benefits and drawbacks of those alternative mechanisms, as well as their different energy consumption profiles.

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[1] 87 Fed. Reg. 17,105-17,107 (March 25, 2022), available at: https://www.federalregister.gov/documents/2022/03/25/2022-06284/request-for-information-on-the-energy-and-climate-implications-of-digital-assets.

Blockchains are distributed databases designed to record, communicate, and transact value without the need for a central authority. Most blockchains are built on a network of distributed nodes that work together to validate the transactions that take place on the network that they collectively run. Because of the decentralized nature of these networks, it is necessary for every blockchain network to have a mechanism to ensure all of its nodes are synchronized with one another, agree on which transactions are legitimate, and maintain the security of the network against mistaken or malicious actors. This decentralized system for determining which transactions are recorded on a blockchain network is called a "consensus mechanism." In addition to ensuring the core operations of a blockchain, consensus mechanisms directly impact the rules, economic conditions, and security of the networks they underpin.

Designing and implementing an effective decentralized network is a difficult challenge that has led cryptographers, security researchers, and software engineers to come up with different consensus mechanisms that promise to best suit the strategic priorities of a given network. Below are descriptions of the two most widely utilized consensus mechanisms, Proof-of-Work and Proof-of-Stake. However, there are other types of consensus mechanisms utilized within the blockchain ecosystem as well.[2]

Proof-of-Work ("PoW") networks require computers to compete for the opportunity to add new "blocks" of transactions to the blockchain in exchange for transaction fees and a reward in the form of the blockchain's native asset. The competition involves solving hash functions, which (to put it simplistically) are math problems that can only be solved via trial and error but, once solved, can be easily checked and verified. Solving hash functions requires computational power, which requires an expenditure of energy in the form of electricity. Additionally, electricity is needed to cool computational hardware while it is solving these math problems. This competitive process protects the network's ledger of transactions from manipulation by imposing a high cost—in this case in the form of computing power dedicated to solving hash functions—on participants attempting to change or add data to the blockchain. Participation in this consensus process is colloquially referred to as "mining."

Proof-of-Stake ("PoS") networks rely on validators rather than miners to add blocks to the blockchain. Instead of using computational power to solve hash functions as PoW miners do, PoS validators "stake" some of the blockchain's native tokens—locking those tokens up so that the validator cannot transfer or sell them—to become eligible for random selection as the node with the right to add the next block to the blockchain. When a validator adds a new block, that validator is typically rewarded with network transaction fees and new units of the blockchain's native asset. In this way, PoS seeks to achieve the same goals as PoW without requiring a significant expenditure of energy to solve hash functions.

PoW consensus mechanisms are generally viewed as more battle-tested and provably secure than PoS mechanisms. Yet, the high energy cost of PoW consensus mechanisms have ultimately led some within the industry to seek alternatives to PoW, like PoS. While the PoS consensus

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[2] Although there are many alternative consensus mechanisms being utilized in the crypto ecosystem, many of these alternatives incorporate similar processes and components. For an in-depth exploration of these alternatives, check out this article: https://www.gemini.com/cryptopedia/blockchain-consensus-mechanism-types-of-algorithm#section-proof-of-contribution-po-c-po-co-consensus-mechanism.

mechanism provides blockchain networks with a less energy-intensive method for securing these networks, it is still a developing technology that has not been battle-tested as thoroughly as PoW.

Although it is helpful to understand the advantages and disadvantages of PoW and PoS, policymakers should be cautious about prematurely judging the relative costs and benefits of these and other consensus mechanisms currently being used within the crypto ecosystem. All of these technologies are still in their infancy and will likely change and develop significantly over the coming months and years. While the top cryptographers and engineers in the world continue to debate the security and efficiency tradeoffs of these systems, it would be inappropriate for policymakers to decide that one mechanism is manifestly superior to another, either from an environmental perspective or otherwise. Instead, policymakers should let the innovative process continue so that the best technology can prevail in the market, and should avoid calls to favor or discriminate against one consensus mechanism or another.

2. *Hardware:* Information about the climate impacts from the physical components that run the protocols for digital assets. This includes the embodied emissions of specialized hardware and cooling equipment used to mine certain cryptocurrencies, as well as the waste generated from this equipment needing to be replaced frequently due to rapidly improving mining equipment. This also includes potential mitigating measures and technology improvements to reduce the environmental impact from hardware usage.

While miners can reduce electricity costs and negative environmental externalities by using renewable sources of energy, they can also reduce energy consumption and costs by employing the most efficient computational technologies available. Between 2009 and 2020, mining hardware has undergone four major iterations that have significantly improved the efficiency of mining equipment. In 2009, standard central processing units ("CPUs") were used to mine the first crypto, bitcoin. One year later, bitcoin miners began using the more powerful graphics processing units ("GPUs"). By 2011, field-programmable gate array ("FPGA") hardware was the equipment of choice for miners. Just a year later, mining operations began to implement application-specific integrated circuits ("ASICs"). According to the International Energy Agency, "the latest ASICs are both more powerful and more energy efficient – around 50 million times faster (H/s) and a million times more energy efficient (H/J) in mining bitcoin than the CPUs used in 2009."[3] As industry continues to grow and progress, one can only assume that this drive for energy efficiency will continue, hopefully with similar success.

Although the industry has seen a rapid modernization of mining hardware, the older hardware is far from obsolete. Indeed, "according to the nonce analysis data from CoinMetrics, the S9 series of mining hardware, even though it was first introduced as early as 2016, still generates more than 20% of the hashrate."[4] There are two reasons why this older equipment is still utilized to such an extent today. First, miners are increasingly co-locating facilities near renewable energy resources that are frequently curtailed due to low demand. Miners can take advantage of this low-cost, carbon-free energy to turn a profit from hardware that is not cost-efficient on other

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[3] Kamiya, George. "Bitcoin energy use - mined the gap." *International Energy Agency* (July 5, 2019), available at: https://www.iea.org/commentaries/bitcoin-energy-use-mined-the-gap.
[4] CoinShares. "The Bitcoin Mining Network: Energy and Carbon Impact." (January, 2022) available at: https://coinshares.com/research/bitcoin-mining-network-2022.

energy sources. Second, the rapid rise in the price of bitcoin has made older, less-efficient units profitable again, despite having been rendered unprofitable due to increases in mining difficulty.

Additionally, because many of the components of the mining hardware, including the heat sinks and the frames of the mining equipment, are made of highly recyclable and sought after aluminum, miners are economically incentivized to recycle their old equipment.

3. *Resources:* Information about the resources used to sustain and power digital assets. This includes the electricity that powers mining rigs and the water used to cool those operations, as well as potential mitigating measures to reduce the amount of electricity and water used. This also includes quantitative estimates of the total amounts of these resources used by particular types of digital assets, or by the digital asset ecosystem at large. This also includes information concerning whether the costs of resources used are borne equitably across society or are disproportionately borne by historically disadvantaged communities.

Although the exact electricity consumption of the bitcoin network cannot be determined, it is estimated that bitcoin consumed 62 TWh of electricity in 2020, which resulted in 33 million tonnes of carbon dioxide emissions. These statistics represent just 0.04 percent of global primary energy consumption and 0.1 percent of global carbon emissions.[5] Currently, the University of Cambridge's Center for Alternative Finance estimates that the bitcoin network will consume 147.94 TWh of electricity in 2022 although the theoretical lower bound of that estimation is 54.25 TWh so only time will tell as to the actual electricity consumption of the bitcoin network throughout 2022.[6] What is known at this time, however, is that the energy mix of this network is trending towards the use of renewable energy sources.

With Kazakhstan increasingly curbing miners' ability to operate in the nation,[7] the largest concentrations of bitcoin mining operations are located in the United States and the Russian Federation.[8] Iceland, Sweden, Norway, Georgia, and Quebec, all areas rich in renewable, low-cost sources of energy, also have considerable mining operations as well. Interestingly, the majority of the regions in which mining is geographically concentrated are likewise rich in renewable energy resources: Iceland (100% renewable energy), Quebec (99.8%), British Columbia (98.4%), Norway (98%), and Georgia (81%). In the United States, mining operations are similarly located in areas with rich sources of renewable energy like the Pacific Northwest, upstate New York, and Western Texas. "Voting with their feet," it is evident that miners' demand for cheap energy already incentivizes them to seek and use renewable sources of energy.

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[5] Carter, Nic and Stevens, Ross. "Bitcoin Net Zero." *NYDIG* (September 20, 2021), available at: https://nydig.com/research/report-bitcoin-net-zero.

[6] University of Cambridge's Center for Alternative Finance, "Cambridge Bitcoin Electricity Consumption Index." (May 9, 2022), available at: https://ccaf.io/cbeci/index.

[7] Gkritsi, Eliza, "Kazakhstan Crackdown Forces 106 More Crypto Mines to Close." *CoinDesk* (March 15, 2022), available at: https://www.coindesk.com/policy/2022/03/15/kazakhstan-crackdown-forces-106-more-crypto-mines-to-close/.

[8] University of Cambridge's Center for Alternative Finance, "Bitcoin Mining Map." (May 9, 2022), available at: https://ccaf.io/cbeci/mining_map.

Indeed, recent studies of the energy mix of the bitcoin mining industry suggest that it is an outlier when it comes to renewable usage, yet published statistics vary widely. In a report published by Coinshares, authors Christopher Bendiksen and Samuel Gibbons explain that "our current approximate percentage of renewable power generation in the Bitcoin mining energy mix stands at 74.1%, more than four times the global average."[9] A lower bound estimate from the University of Cambridge suggests that "on average, roughly 28% of the total energy supply for both small and large facilities is generated through renewable sources,"[10] still well above the average of other industries. In the transportation industry, for example, renewable energy accounts for only 3.4% of the total energy supply.[11]

4. *Economics:* Information about how the energy use of digital assets is affected by the value of, demand for, and supply of particular digital assets or their underlying infrastructure. This includes the environmental and infrastructural effects from cryptocurrency miners moving to areas with cheaper electricity, as well as the incentives that exist for cryptocurrency miners to use renewable energy sources for mining. This also includes information about impacts on the electric grid and about the need for potential incremental grid investments, along with the impacts on electricity bills for customers near or in affected service territories.

Crypto miners are naturally incented to use the lowest cost electricity available to them. While the specific percentage of miners' revenues spent on electricity will vary between operations, it is undoubtedly miners' highest ongoing cost, with one estimate pointing to miners spending 50% of revenues to cover energy expenses.[12] While this percentage will fluctuate with the underlying price of bitcoin, reducing energy costs is the most important action a miner can take to increase profits. In practice, this means finding and using the cheapest available electricity.

Encouragingly, miners' profit motivation for the cheapest sources of electricity increasingly leads them to use electricity from renewable sources. Electricity from solar photovoltaic (PV), geothermal, and on-shore wind sources are already cheaper on average than the most efficient non-renewable source, gas combined cycle. Indeed, the cost of electricity from renewable sources has declined tremendously over the last decade (-92% for solar PV sources), a trend that the U.S. Energy Information Agency expects to continue over the next two decades.[13] As renewable sources of electricity continue to become cheaper to end users than polluting sources, market forces will naturally drive miners to base their operations on renewable sources

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[9] CoinShares Research. "The Bitcoin Mining Network: Trends, Average Creation Costs, Electricity Consumption, and Sources." (June, 2019), available at: https://coinshares.com/assets/resources/Research/bitcoin-mining-network-june-2019-fidelity-foreword.pdf.

[10] Michel Rauchs et al. "2nd Global Cryptoasset Benchmarking Study." (December, 2018), available at: https://www.jbs.cam.ac.uk/wp-content/uploads/2020/08/2019-09-ccaf-2nd-global-cryptoasset-benchmarking.pdf.

[11] International Energy Agency. "Renewables 2018: Analysis and Forecasts to 2023." (October, 2018), available at: https://www.iea.org/reports/renewables-2018.

[12] Carter, Nic and Stevens, Ross. "Bitcoin Net Zero." *NYDIG* (September 20, 2021), available at: https://nydig.com/research/report-bitcoin-net-zero.

[13] U.S. Energy Information Administration. "Levelized Costs of New Generation Resources in the Annual Energy Outlook 2022." (March, 2022), available at: https://www.eia.gov/outlooks/aeo/pdf/electricity_generation.pdf.

of energy. While this trend to renewables will intensify over the next decade, today, the geographic distribution and available data on the energy mix of crypto mining is evidence of the demand for renewable, inexpensive sources of energy among currently operating miners.

It is unlikely that mining operations would materially impact the electricity bills for customers near or in affected service territories. Some operations are set up behind the meter, which means that they do not even interact with energy that is distributed to the power grid. Other operations are buying power from the grid; however, given that each year, ~2,205 TWh is lost via electricity transmission and distribution,[14] an amount far greater than the energy demand of PoW mining, and that mining operations can be set up at the source of the power, it is possible that these mining operations will and are absorbing a negligible amount of energy that would likely be lost during transmission anyhow.

5. *Past or ongoing mitigation attempts:* Information about past or ongoing attempts to mitigate negative climate impacts of digital assets. This includes voluntary industry efforts, and cryptocurrencies that are changing their consensus mechanism in order to reduce their energy usage. This also includes climate-focused and energy efficiency regulation or standards efforts by State, local, territorial, tribal, federal, or foreign governments.

One of the primary drivers for development within the crypto industry has been the desire to mitigate and address any climate impacts associated within digital assets. One such attempt has been centered around increased transparency within the bitcoin mining industry. By providing the public with records of the energy mix that mining operations use to power their equipment, miners can both be held accountable for and demonstrate their commitment to the creation of a crypto mining industry that is rooted in environmentally friendly practices.

For example, at the end of Q4 2021, publicly traded miners represented approximately 18% of the bitcoin network's hashrate. By the end of 2022, public miners are expected to represent 40-45% of the network's hashrate. This increase means that nearly half of the network's energy consumption will be easily auditable and held to the environmental standards crafted by US regulators for the US public equities markets.

In parallel with market-driven reporting, self-reporting organizations like the Bitcoin Mining Council (BMC) have begun to share information on constituent miners' energy mix and consumption. On an entirely voluntary basis, 29 firms representing ~50% of the network's hashrate have reported environmental data on their operations.[15] Many miners have heard the concerns raised by regulators and communities around energy consumption and are committed to bringing light to their impact on the planet. The BMC data shows that participating miners rely on a greener energy mix than most major countries' national grids, and estimates that the same is true for miners across the network. Additionally, several other private sector-led initiatives like the Crypto Climate Accord and the Bitcoin Clean Energy Initiative are

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[14] The World Bank. "Electric Power Transmission and Distribution Losses (% of Output)." (2018), available at: https://data.worldbank.org/indicator/EG.ELC.LOSS.ZS.

[15] Bitcoin Mining Council. "Bitcoin Mining Council Survey Confirms Year on Year Improvements in Sustainable Power Mix and Technological Efficiency." (April 25, 2022), available at: https://bitcoinminingcouncil.com/bitcoin-mining-council-survey-confirms-year-on-year-improvements-in-sustainable-power-mix-and-technological-efficiency/.

working within the industry to ensure that the future of bitcoin mining and crypto mining more broadly are not harmful to the environment.

The mining of crypto is a key piece of the environmental debate surrounding the crypto ecosystem; however, it is not the only one. This technology is a powerful tool that can be leveraged to help both the United States and the world combat the effects of climate change. Some notable examples include blockchain enabled carbon offset marketplaces, the donation of transaction fees on blockchain networks to environmental organizations, and digital, blockchain-powered operating systems for renewable energy grids.

6. *Potential energy or climate benefits:* Information about how digital assets can potentially yield positive energy or climate impacts. This includes potential uses of blockchain that could support monitoring or mitigating technologies to climate impacts, such as opportunities for natural asset or emissions accounting, as well as the exchanging of liabilities for greenhouse gas emissions, water, and other natural or environmental assets. This also includes specific approaches to increase the likelihood of direct climate or emissions benefits from digital assets, or associated grid services that indirectly lead to climate or emissions benefits. Furthermore, information is sought supporting or rebutting claims made by some proponents of cryptocurrencies that the energy used by mining cryptocurrencies is a net climate positive, either because it occurs during demand lulls or because it increases demand for renewable electricity sources.

PoW mining not only seeks low cost, renewable power, but also actively enhances existing power generation, both non-renewable and renewable. Indeed, many mining operations have begun to specialize and integrate with adjacent industries, like the energy industry, where they can provide demand-response services crucial to the renewable energy transition and mitigate some of the effects of fossil fuel companies.

Many renewable energy sources, including wind and solar power, suffer from intermittency and low capacity factors inherent in their production: solar, for example, cannot generate electricity at night. Mining offers an economical, relatively low-waste solution to this problem that can help renewable energy producers compete with fossil fuel based generators. In short, mining operations can incentivize and accelerate the United States' transition to renewable energy generation sources by acting as a prime offtaker for excess energy production. For example, when wind turbines and solar arrays are generating more electricity than there is demand for on the grid, mining operations can turn on and absorb this excess almost instantaneously, helping stabilize the grid frequency while facilitating the purchase of otherwise stranded renewable energy.

Mining operations can also bring a level of resilience to the transitioning US energy grid by helping it stabilize around its target frequency. When power generation and available capacity becomes constrained due to various environmental events, like winter storms or summer heat waves, demand on the grid often remains higher than the available supply of electricity. In events like this, miners can turn off their operations and send that electricity *back to the grid* thus preventing rolling brownouts and blackouts. This immediate response to frequency deviation events allows miners to be the most flexible, sophisticated participants in the history of energy markets - a welcomed and much needed amenity for an aging electrical grid that is constantly balancing electrical supply and demand with transmission constraints amidst a transition to renewable generation sources. Indeed, according to Brad Jones, interim CEO of ERCOT, Texas's independent power grid, "we can use that crypto to soak up the excess generation and really provide a home for more wind and more solar to come to our state...so it's a great balancing act."[16]

Mining operations and their ability to operate as a flexible load resource (i.e., turn off and on rapidly based on the demand of the electrical grid) will not only bring resiliency to the United States' transitioning energy grid but will also deploy substantially more renewable energy thus expediting this transition. Currently, there are >200 GW of delayed solar and wind capacity currently in just three U.S. grid interconnection queues.[17] These are solar and wind projects which have developers and financing readily available, but which grids physically cannot accommodate. Over the past year, several mining operations have begun to make considerable progress in incorporating more renewable sources into the US's electrical grid. For example, an additional 16 GW of wind and solar projects are now set for construction in 2022, all facilitated, in part, through the incorporation of Bitcoin mining as variable output shock absorber.[18] In March, Blockstream partnered with a subsidiary of Norwegian energy player, Aker, to establish Bitcoin mining operations across their wind, solar and hydro portfolio as a "load-balancing economic battery."[19] In June, Square invested $5m to build a 100% solar Bitcoin mining facility.[20]

Bitcoin mining can also help fossil fuel companies reduce emissions and become greener through a process known as *flare mitigation*, which generates electricity from associated gas that would otherwise be vented (let out into the atmosphere) or flared (combusted) on-site.

In the oil production process, associated gas is produced at the wellhead as a waste product. This associated gas is a variable mixture of methane, propane, ethane, and other volatile organic compounds (the exact gas composition is dependent upon the downhole formation and other factors). There are plenty of commercial and industrial uses for this gas, but methane makes up the majority of associated gas composition and it cannot be economically transported without gathering systems, compressor stations, and gas pipelines. As such, oil producers routinely flare associated gas where it is not economically feasible to construct gas takeaway infrastructure.

Unfortunately, the global warming potential of vented, or uncombusted, methane is roughly 82.5 times as environmentally damaging as those of an equivalent quantity of CO2 over a 20 year period.[21] Flaring burns the methane and produces CO2 as a byproduct, theoretically reducing the CO2 equivalents by 24x. With ~150TWh of energy being flared or vented in the US alone each year as waste - a quantity larger than some of the highest estimates of Bitcoin mining's energy use- however, the environmental impact of flaring or venting gas cannot be

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[16] "Crypto mines help ERCOT keep renewable energy operational, says interim CEO." *CNBC Television* (March 18, 2022), available at: https://www.youtube.com/watch?v=gKnRfDeFgr0.
[17] Bitcoin Clean Energy Initiative. "Bitcoin is Key to an Abundant, Clean Energy Future." *Square* (April, 2021), available at: https://bitcoin.energy/files/BCEI_White_Paper.pdf.
[18] Ibid.
[19] Røkke, Inge Kjell. "Shareholder Letter." *Seetee* (March 8, 2021), available at: https://www.seetee.io/.
[20] Cook, Chris. "Blockstream and Square, Inc. Join Forces for Solar-Powered Bitcoin Mining." *Blockstream* (June 5, 2021), available at: https://blog.blockstream.com/en-blockstream-and-square-inc-join-forces-for-solar-powered-bitcoin-mining/.
[21] The United Nations Economic Commission for Europe."Methane Management: The Challenge." available at: https://unece.org/challenge.

understated.[22] Bitcoin mining offers a solution.

Instead of flaring or venting gas, companies like Upstream Data and Crusoe Energy Systems are building infrastructure to capture this methane at the wellhead and use the otherwise-wasted gas to mine bitcoin. Consuming a highly insulating pollutant, methane-rich flare gas, with no additional extraction mitigates one of the largest sources of methane in the atmosphere while providing bitcoin miners with an inexpensive source of energy. Flare mitigation strategy employing bitcoin mining could also lead to less pipelines as waste energy can be consumed onsite with containerized solutions. Further, energy transportation is notoriously difficult and bitcoin acts as a demand source that eliminates any need for energy transport.

7. *Likely future developments or industry trajectories:* Information about likely future developments or industry trajectories that would have implications for the future climate impacts of digital assets. This includes expected future developments in protocols, hardware, resources, and economics. Where possible, please describe the expected timescale for likely future developments.

As the crypto industry develops from infancy to adolescence, it is likely that PoW mining will become more environmentally friendly and the mining industry itself will trend towards the use of less energy intensive consensus mechanisms.

Although PoW cryptos are a critical component of the industry, they have declined as a percent of the total crypto market cap over time. Indeed, in August 2021, 25% of the top 20 cryptos by market cap were non-PoW currencies. This percentage will only increase if and when the Ethereum network successfully completes its transition to PoS.

As demonstrated above, the PoW mining industry, while energy intensive, has committed itself to transparency and sustainability. It is the goal of many, if not most, within the industry to create environmentally friendly mining practices that bolster the United States efforts to meet its climate related goals. Organizations and efforts like the Crypto Climate Accord, the Bitcoin Mining Council, and the Bitcoin Clean Energy Initiative are already taking steps to make industry more green. It is critical that efforts like these are given the time and support necessary to continue their efforts.

8. *Implications for U.S. policy:* Information about how the climate impacts of digital assets might have implications for U.S. policy. This includes implications for energy policy, including as it relates to grid management and reliability, energy efficiency incentives and standards, sources of energy supply, greenhouse gas intensity, and the transition to a net-zero emissions economy by 2050.

From a policy perspective, it is critical that PoW mining is incentivized to both occur within the United States and trend towards the use of renewable energy sources. Indeed, as fossil fuel dependent nations like China and Kazakhstan increasingly enact rules that curb or outright ban PoW mining, it is in the best interest of the United States to redirect those operations into its

[22] U.S. Energy Information Administration. "Natural Gas Annual." (September 30, 2021), available at: https://www.eia.gov/naturalgas/annual/.

borders where a regulatory framework that upholds robust environmental standards can be crafted and enacted. In short, the best way to ensure that PoW mining continues to be dominated by renewable energy sources is by creating a US regulatory environment for miners that is both welcoming and incentivizes the use of renewable energy sources. In addition to benefiting energy policy by bolstering the United States' transition to renewable energy sources, PoW can also help stimulate local economies within the United States.

PoW mining has created economic opportunity for traditionally-neglected communities, especially in rural, de-industrialized areas of the Midwest, South, and Appalachia where highly-paid, skilled labor positions in the construction and electrical industries are making a comeback. In short, the PoW mining industry is a boon for American blue-collar workers.

Throughout the country, there are mining farms in areas whose economies were uprooted by globalization, including Stronghold's facility in Scrubgrass, northwest Pennsylvania; Riot's site in Rockdale, Texas, near an old Alcoa site; and Soluna's under-construction site in Kentucky. These mining farms offer well-paid, sustainable, blue-collar jobs to residents of these largely underserved communities.

Bitcoin mining facilities have the potential to be anchor employers for small communities in the American heartland, and unions including northwest New York State's International Brotherhood of Electrical Workers Local 840 have spoken out in support of bitcoin mining farms and the gainful employment that they create.[23] The mining ecosystem has continued to grow, and has created jobs for construction workers, security guards, electricians, technicians, network architects, software engineers, and hardware engineers. It is essential that policy is crafted in favor of this job creating industry.

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It is critical that the transformative potential of cryptocurrency and blockchain technology is not lost on policymakers in the United States. Indeed, this burgeoning ecosystem has the potential to deliver applications that will not only bring efficiency and inclusion to the global financial system, but will also revolutionize the way that ordinary people go about their daily lives. The Association applauds OSTP's efforts to understand the environmental implications of this technology, and we continue to offer ourselves as a resource that OSTP can leverage in this pursuit.

Sincerely,

Kristin Smith
Executive Director

Jake Chervinsky
Head of Policy

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[23] The International Brotherhood of Electrical Workers (IBEW). "IBEW Local 840 to support for Greenidge Generation at hearing." The Chronicle Express (October 13, 2021), available at: https://www.chronicle-express.com/story/news/2021/10/13/ibew-local-840-support-greenidge-generation-hearing/8439201002/.