



Testimony for the record
by the Environmental Working Group
Submitted to the Senate Environment and Public Works Subcommittee on Clean Air,
Climate and Nuclear Safety
“Air, Climate, and Environmental Impacts of Crypto-Asset Mining”

March 7, 2023

Chairman Markey and Ranking Member Ricketts, thank you for holding today’s hearing on legislation to address the environmental issues associated with cryptocurrency mining facing communities across rural America. The Environmental Working Group endorses the Crypto-Asset Environmental Transparency Act of 2023 and believes it is necessary to help curb the increasing greenhouse gas emissions and water, air and noise pollution associated with proof of work cryptocurrency mining.

Introduction

Cryptocurrency mining operations in search of low-cost electricity, cheap land and limited local planning or zoning regulations are taking root in rural communities located in pristine natural environments across the country. Bitcoin’s insatiable need for energy has led the crypto-mining industry to revive shuttered coal-fired power plants, siphon energy resources away from more economically productive uses, and even burn piles of waste coal too dirty for coal companies to sell.

The Environmental Working Group does not oppose cryptocurrency. Millions of people own cryptocurrency. We don’t need to eliminate the use of digital currencies, but we do need to increase transparency in a largely unregulated industry and change the way certain types of digital currencies are validated if we want to avoid the worst effects of climate change and keep the U.S. on track to meeting its climate commitments.

Certain types of cryptocurrencies, such as bitcoin, are “mined” using a process known as **proof of work**. The “work” in proof of work comes from using powerful computers in a race to solve complex puzzles to validate cryptocurrency transactions. Once puzzles are solved and transactions are validated, new cryptocurrency ledgers are added to the blockchain. The owner of the “winning” ledger is rewarded in cryptocurrency coins or tokens. This process is wasteful by design because each time a new puzzle is solved, the next puzzle becomes even harder, requiring more computing power and more electricity.

Local impacts

Kentucky. Bitcoin mines can appear seemingly overnight and are difficult to track. As the [Kentucky Conservation Committee](#) notes on its website: “Because existing laws, regulations, and/or permits mostly do not require that mining operations make this information available to any government agency or the public, it is notoriously difficult to discover how much a particular entity is using, or even an operation’s fuel source.”

Coal-rich Kentucky is home to almost 20 percent of all proof of work bitcoin mining operations in the U.S., according to the committee. About 66 percent of electricity generated in Kentucky in November 2022



[came from coal](#). And because the energy for bitcoin mining derives mostly from coal-fired power, the state emits more carbon dioxide associated with bitcoin mining than any other state, according to the group.

When crypto mines come to town, they can also affect local residential electricity costs, since ratepayers are often left [paying for the upgrades](#) the grid needs in order to sustain the increased energy load proof of work crypto mining requires. Some mining companies pitch their operations as lifelines for economically hard-hit communities. But they bring very few jobs and often increase electricity bills for locals – all while the state offers the miners significantly discounted energy rates.

Montana. Hardin Generating Station formerly served as a coal-fired power plant generating electricity for the surrounding area. Owned by Beowulf Power, the plant was slated to close by 2018 until Hardin struck a deal with [Marathon Digital Holdings](#) to keep the plant online for the purpose of mining bitcoin.

In 2021, Marathon’s operations at the Hardin plant produced 755,700 tons of carbon dioxide emissions – its highest annual emissions since 2014. That year it also generated 304 tons of sulfur dioxide and 245 tons of nitrogen oxides. Last year Marathon announced plans to shutter the plant and move its miners to new locations with renewable power sources.

Without comprehensive federal policy, communities are left on their own to fight multi-million-dollar proof of work mining operations. In a rare victory, Missoula County in 2021 established [first-in-the-nation zoning regulations](#) restructuring where and how crypto mines can be located.

Georgia. Noise pollution associated with crypto mining became a major concern for local residents in Adel when a bitcoin mining company, [Blockstream](#), moved in next door. When Blockstream was operating its miners 24 hours a day, seven days a week, local residents' who lived next door recorded noise levels at or above the 70 decibels, the rate the [Centers for Disease Control and Prevention](#) warns is harmful.

The facility has reduced its operations so its noise level now ranges between 30 and 40 decibels, in keeping with the trend of mines slowing down as the price of bitcoin fluctuates. But the noise is still deafening. Not everyone can afford to install insulation to drown it out, or afford to move – nor should they have to.

New York. Water pollution associated with large-scale bitcoin mining operations have sparked an outcry from local residents of Seneca Lake, part of New York’s pristine Finger Lakes region. [Greenidge Generations Holdings](#) has been using a former coal-fired power plant that they hooked up to natural gas in Dresden since 2020 to power its bitcoin mining operations.

In addition to the air pollution associated with the use of natural gas – another dirty fossil fuel that emits greenhouse gas emissions – Greenidge’s proof of work bitcoin mining requires millions of gallons of water. At its peak, Greenidge can discharge as much as 134 million gallons a day into the lake at temperatures up to 108 degrees. This can distress local aquatic life, including trout, and could contribute to [toxic algae blooms](#).

Gov. Kathy Hochul recently signed into law a bill that imposed a [two-year pause](#) on new proof of work cryptocurrency mines powered by fossil fuels. It is intended to last until the New York State Department of Environmental Conservation conducts a study on the potential environmental impacts.



Pennsylvania. Stronghold Digital Mining boasts on its website that its energy-intensive operations are actually an “environmentally beneficial” way to “remediate the impacts of 19th and 20th century coal mining in some of the most environmentally neglected regions of the U.S.” The company claims to be more of a coal refuse reclamation company than a bitcoin miner, but that couldn’t be further from the truth.

Stronghold claims to be “saving” Pennsylvania communities by taking piles of waste coal stored out in the open and burning it to mine bitcoin. The waste coal the company burns to mine bitcoin is low-quality coal discarded by previous coal-mining operations. That’s because its low energy content and high contamination levels rendered the coal unfit for commercial sale. So burning waste coal is not only more inefficient but also more pollution-intensive than burning even commercially marketed coal.

Burning coal waste creates carbon emissions that contribute to the climate crisis. It also increases emissions of heavy metals, acid gasses and air toxics. These pollutants can hurt communities living closest to the facilities that are powering crypto mining, including some areas that have been historically disproportionately affected by pollution.

The problem

Proof of work crypto miners use a variety of power sources to provide electricity for their computers. But experts estimate that mining for cryptocurrencies like bitcoin results in far more greenhouse emissions. U.S.-based bitcoin miners are already responsible for [one-quarter](#) of the global greenhouse gas emissions. The electricity used to mine bitcoin in 2020 resulted in almost [60 million tons](#) of carbon dioxide emissions, according to one estimate. The carbon dioxide emissions from mining ethereum and bitcoin in 2021 [equaled](#) the tailpipe emissions of more than 15 million gas-powered cars.

Between 2017 and 2022, annual estimated electricity demand from bitcoin mining increased from 7 terawatt-hours, a measure of electricity, to more than 90 terawatt-hours. By contrast, electricity demand by comparable sectors has not increased – and has even declined in some. Data centers have not hiked their electricity demand, even though internet traffic and data center workloads have ramped up significantly as a result of cryptocurrency mining.

As the Intergovernmental Panel on Climate Change, or IPCC, [warned](#) last April, digital currencies like bitcoin are likely to “be a major global source of CO2 if the electricity production is not decarbonised.” [This year](#) countries will review progress toward Paris Agreement goals, including the goal of keeping global warming to well below 2 degrees Celsius while pursuing efforts to limit it to 1.5 degrees Celsius.

The recent **White House Office of Science and Technology Policy report** found that crypto assets represent 0.9 percent to 1.7 percent of U.S. electricity use, comparable to all home computers or all residential lighting in the U.S. The report also found that, depending on the energy intensity of the technology and the sources of electricity used, the **rapid growth** of crypto assets **could hinder broader efforts to achieve U.S. climate commitments** to reach net zero carbon pollution.

Cryptocurrency mining doesn’t need to waste electricity with proof of work. **Much more energy-efficient processes** exist, like proof of stake, which ethereum recently adopted. Unlike cryptocurrencies that use proof of work, those that use **proof of stake**, or other energy-efficient methods, to validate cryptocurrency transactions do so without using computing power to solve complex puzzles. Instead, proof of stake asks individuals to put at “stake” their own cryptocurrency assets as collateral for the



prospect of having their record of validating transactions made official and added to the blockchain. If selected, they will earn new cryptocurrency coins or tokens.

From [2016](#), ethereum – the world’s second-largest cryptocurrency, behind bitcoin – had been running two versions of its cryptocurrency in parallel. One version was using the energy-intensive proof of work process to “mine” and validate transactions, while the other was using proof of stake. The “merge” that occurred last year signified the consolidation of the two versions, and the complete switch away from the dirty ways of proof of work to the energy-efficient proof of stake. This resulted in a reduction of ethereum’s overall energy consumption by [99.95 percent](#).

Combatting industry greenwashing

Rather than investing in long-term energy infrastructure that benefits the grid, the cryptocurrency mining industry seeks the fastest source of energy that can serve its high capacity needs, with minimal regulation and oversight. In practice, that translates to mining cryptocurrency at coal and gas plants, straining the electric grid in states already suffering from extreme weather events, and tapping into power grids that are often fossil-fuel heavy.

Most mining facilities draw their power from the grid, so electricity is generated by whatever the existing energy source is in that region. Currently, no grid anywhere in the U.S. is 100 percent renewable. Proponents claim that mining is driving new renewable development and stabilizing the grid. But clean energy allocated to crypto mining doesn’t actually do anything to decarbonize the grid, and there are few mining facilities that are building renewables to even power their own operations, let alone send to the larger grid.

Crypto mining proponents claim that mining only uses “wasted” energy from solar or wind overproduction. But mining operations consume energy 24 hours a day, seven days a week, not just when there is excess solar or wind. Mining operations would fail to be profitable if they used only the hours when “wasted” energy is available.

Bitcoin has also sought to reduce their emissions by purchasing carbon offsets, but the offsetting services they buy don’t directly lower greenhouse gas emissions, let alone account for the enormous amounts of energy from their own operations. This greenwashing perpetuates energy usage and emissions increases, not reductions.

Conclusion

Under current law, there is no requirement that proof of work mines be powered by renewable energy, be more energy efficient, or even report their energy use and climate pollution. The U.S. needs all the clean energy we can get to power our homes, cars and businesses. We should not divert clean energy to an inherently wasteful use of electricity.

We’re at a crossroads. The recently completed ethereum merge and past code changes show that transformation by the crypto community is possible. Every industry, including the financial sector, can reduce its electricity use and greenhouse gas emissions. Adding more electricity demand – as proof of work mining will ultimately require – sends us in the wrong direction.



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Sen. Markey's bill, the Crypto-Asset Environmental Transparency Act of 2023, sends us in the right direction.

Thank you for the opportunity to provide testimony for the record.

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