



Iowa Environmental Council

CRYPTOCURRENCY MINING - FINANCIAL & ENVIRONMENTAL RISKS TO IOWANS

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Cryptocurrency, such as Bitcoin, is a complex technological development that has some people chasing short-term profits. Proponents make big claims about the value and potential of this technology as an alternative to traditional money and finance. However, current processes for creating cryptocurrency are wasteful, can create a nuisance for their neighbors, and can drive up bills for other ratepayers.

What is a Cryptocurrency mine?

The creation of new cryptocurrency is a complicated computing process referred to as *mining*. Bitcoin, like other cryptocurrencies, exists only on a digital network that is distributed across millions of computers around the world. This network (called the *blockchain*) generates new Bitcoins through a competitive program that requires users to solve a complex equation by racing their computer systems against others on the network. The first user to solve the equation receives new Bitcoin. This process repeats over and over again, 24 hours a day. This competition is winner-take-all for each Bitcoin and requires a fast, powerful system of computers to compete. This fast, powerful computer system is called a *cryptocurrency mine*, and these mines consume massive amounts of electricity and water, while generating considerable electronic waste.

Cryptocurrency and noise pollution

Keeping the computers in a crypto mine temperature-controlled requires powerful air conditioning, and that means noise. The roar of fans in cooling systems can reach 95 decibels, as loud as standing next to a revving motorcycle, and the noise runs all day and night.¹ Noise complaints from residents has been a major factor in multiple rejections of new crypto mines throughout Iowa, including proposed operations in Black Hawk County and Grundy County.²

¹ "Cryptocurrency Mining in Texas" *Earthjustice* - <https://earthjustice.org/feature/cryptocurrency-mining-texas>

² "Cryptocurrency mining firm struggles to expand in Eastern Iowa" *The Gazette*, August 12, 2022

How much electricity does crypto mining use?

According to the Energy Information Administration, cryptocurrency consumes over 2% of U.S. electricity; US Bitcoin production alone consumes roughly the same amount of energy as Utah.³ Globally, crypto mining uses, conservatively, 204.5 TWhs of electricity, as much energy as Greece or Australia, with a carbon footprint (1088.94 kgCO₂) of the oil nation Kuwait.⁴ Crypto activity in the United States is estimated to result in CO₂ emissions similar to those from diesel fuel used in railroads in the United States. A crypto mine in Grundy Center, Iowa uses as much electricity as 4,900 homes, more electricity than all the residential customers in Grundy Center, population 2,800, combined.⁵

Expansion of electric generation to allow for crypto mining will lead to higher rates for all customers as the cost of expansion is eventually rolled up into the rates we all pay. If the crypto mines are in MidAmerican or Alliant service territory, the mines can also benefit from demand-response programs that pay them to be willing to interrupt their electricity service during peak energy use hours, whether they actually ever shut down or not.⁶

How much water does crypto mining use?

A massive amount of water is needed to cool the computer rigs that process and maintain the Bitcoin blockchain and to cool the fossil fuel power plants that supply the crypto mines power; as a result, the global water footprint is **16,279 liters per transaction** as of 2020.⁷ That's equivalent to flushing over 4,300 toilets for each and every transaction. The total water footprint of US Bitcoin miners is approximate to the average annual water consumption of 300,000 US households, comparable to a city like Washington, DC.⁷

How much electronic waste does crypto mining create?

Discarded computers, circuit boards, cables, and other electronic waste from crypto mining contributes to electronic waste. Without standards and enforcement of proper disposal methods, electronic waste can cause air and water pollution, expose workers to toxic substances, and damage public health. Lead and mercury are the most common toxic elements in electronic waste.⁸ In June 2022, Bitcoin mining activity produced electronic waste at an estimated rate of 35,000 tons per year, equivalent to the annual electronic waste of the Netherlands.⁹ A phenomenon driving all this waste is the pace of innovation in mining ASICs, or application-specific integrated circuits, the dedicated computer units for crypto mining. Improvements in technology can double computer processing speeds of new ASICs every eighteen months, requiring constant upgrading to remain competitive.¹⁰

³ [Crypto Mining Uses an Insane 2% of U.S. Electricity - Heatmap News](#)

⁴ ["Climate and Energy Implications of Crypto-Assets in the United States" - Whitehouse.gov](#)

⁵ ["Bitcoin mining site near Grundy Center uses more energy than town" - The Gazette](#)

⁶ ["Environmental Impacts of Crypto Mining" - Earthjustice.org](#)

⁷ ["Bitcoin's Growing Water Footprint" - Cell Reports Sustainability - https://www.cell.com/cell-reports-sustainability/pdf/S2949-7906\(23\)00004-6.pdf](#)

⁸ ["The evolution of consumer electronic waste in the United States" - Wiley Online Library - https://onlinelibrary.wiley.com/doi/abs/10.1111/jiec.13074](#)

⁹ [Bitcoin Energy Consumption Index - Digiconomist.net](#)

¹⁰ ["Implications of Historical Trends in the Electrical Efficiency of Computing" - https://ieeexplore.ieee.org/document/5440129](#)