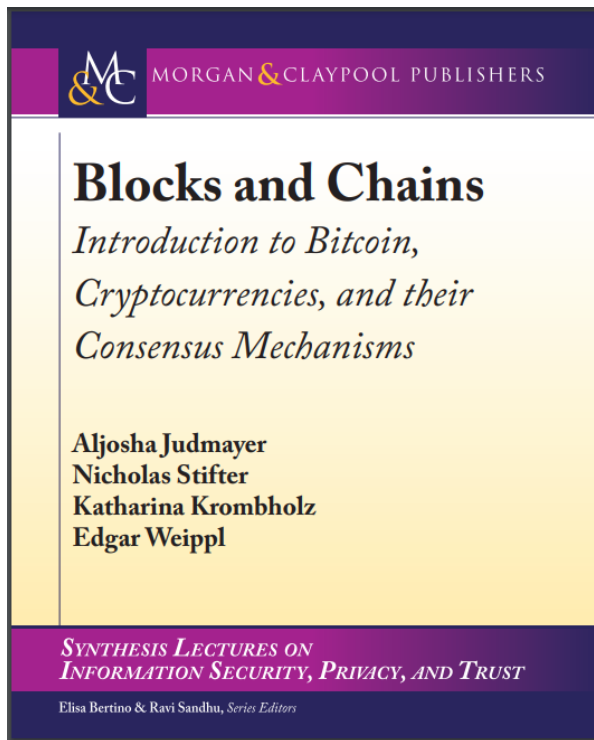


# How to Address the energy consumption in cryptocurrency mining

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Judmayer et al. (2022). *Blocks and Chains: Introduction to Bitcoin, Cryptocurrencies, and Their Consensus Mechanisms*. Springer Nature

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### Economic estimation of Bitcoin mining's climate damages demonstrates closer resemblance to digital crude than digital gold

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#### Abstract

This paper provides economic estimates of the energy-related climate damages of mining Bitcoin (BTC), the dominant proof-of-work cryptocurrency. We provide three sustainability criteria for signaling when the climate damages may be unsustainable. BTC mining fails all three. We find that for 2016–2021: (i) per coin climate damages from BTC were increasing, rather than decreasing with industry maturation; (ii) during certain time periods, BTC climate damages exceed the price of each coin created; (iii) on average, each \$1 in BTC market value created was responsible for \$0.35 in global climate damages, which as a share of market value is in the range between beef production and crude oil burned as gasoline, and an order-of-magnitude higher than wind and solar power. Taken together, these results represent a set of

Jones, B.A., Goodkind, A.L. and Berrens, R.P., (2022). Economic estimation of Bitcoin mining's climate damages demonstrates closer resemblance to digital crude than digital gold. *Scientific Reports*, 12(1), pp.1-10.



Criddle, C. (2021). Bitcoin consumes 'more electricity than Argentina'. [online] BBC News. Available at : <https://www.bbc.com/news/technology-56012952> [Accessed 13 March 2023]

## What is cryptocurrency?

- A type of digital currency that is secured by cryptography.

## How to get cryptocurrency?

- A complex process called “mining” is used, which requires advanced computer equipment to calculate math puzzles and cost energy.

## Why is the energy consumption of mining is becoming an increasingly significant problem?

- With rapid price increases in bitcoin at the end of 2020, the energy consumption has significantly increased and caused more climate damages.
- 2021: Each bitcoin exhausts 113 tons of CO<sub>2</sub>.

## How much energy is used in mining?

- About 6 GW of power(bitcoin only)
- similar as the energy consumption of Argentina.

## Why mining is a method that doesn't work well?

- Mining doesn't create real value.
- The energy consumption increases as more devices join.