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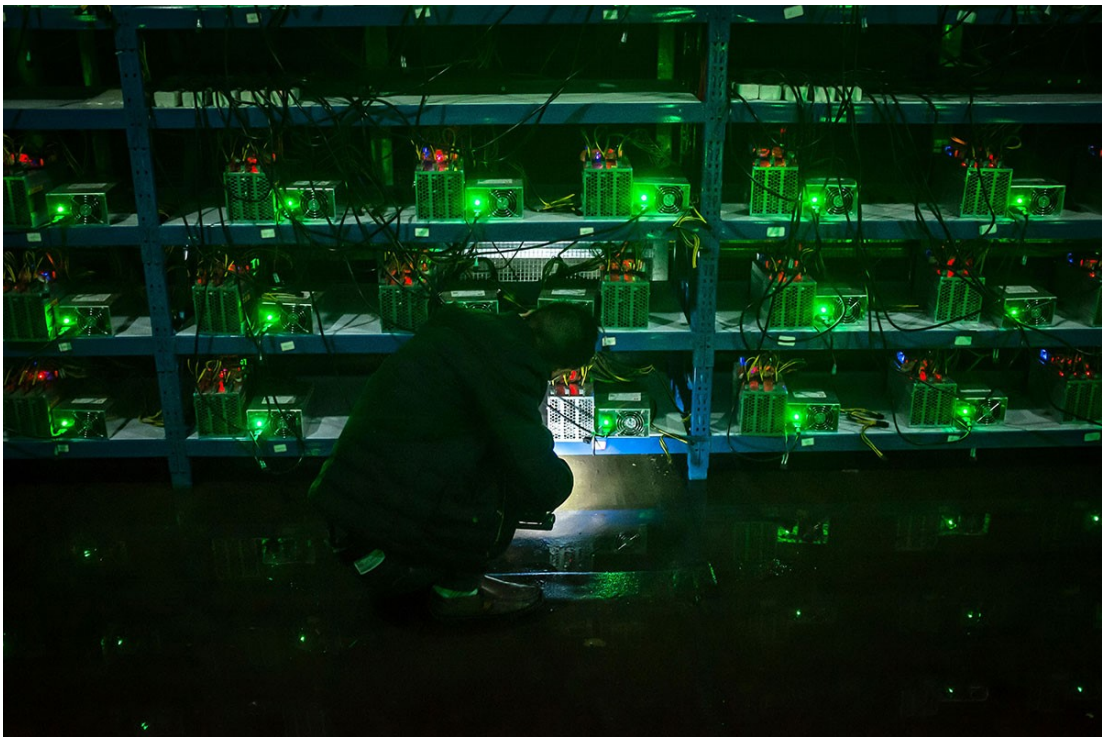
Bitcoin mining uses more energy than Ecuador – but there's a fix



Chain reaction: bitcoin is an energy hog
Liu XIngzhe/Chinfile/EPA/Rex/Shutterstock

By **Abigail Beall**

Bitcoin has an energy problem. The cryptocurrency and the blockchain it runs on, have long been heralded as shining examples of the future of transactions, replacing people with an array of number-crunching computers. But the considerable energy impact of this approach is starting to become clear just as the blockchain and cryptocurrencies are exploding into the mainstream.

That realisation has spawned a host of strange workarounds, from heaters that warm your home with the blockchain to renewable mining. Now, the creator of one of the world's biggest cryptocurrency networks has announced a major change to address the problem.

We've known for a while that bitcoin hogs energy. That's down to the way it works with the blockchain. Each transaction starts with a user broadcasting the details of

that transaction to a network of linked computers, where it is duplicated in thousands of identical unfalsifiable ledgers. "A blockchain, including bitcoin, has to operate on the assumption that no other computer can be trusted," says Teunis Brosens, economic analyst at ING. So instead of trusting anything, each computer independently verifies part of the transaction, in a process called mining.

Mining prevents computers creating fake ledgers. They need to show "proof of work", a gruelling cryptographic puzzle that takes so much processing power that generating false entries becomes prohibitive.

All that processing guzzles a lot of electricity: one of the latest estimates put the annual electricity consumption of bitcoin mining at 23.07 terawatt hours, roughly the amount of electricity used by Ecuador each year.

Peanuts compared to internet

That's still peanuts compared to the energy use of the internet. Still it's more than enough to be useful, so a number of enterprising bitcoin miners made space heaters that can turn all processing into useful warmth. The Russian cryptocurrency start-up Comino is hoping to make a business of it. However, outside the mining community in cold places few people have given much thought to bitcoin's energy use.

But things are changing. In the past year, rival cryptocurrencies have sprung up to challenge bitcoin, and an increasing number of companies are actually beginning to build long-promised business models on the blockchain from real estate to voting. "I don't think finding uses for the produced heat is a realistic solution [anymore]," says a bitcoin miner who goes by the name of OgNasty.

If bitcoin were to suddenly double in popularity overnight, the network would consume the energy of 5 million US households.

To offset the electrical burden of trading operations, when OgNasty started mining in 2012, he set up the Green Energy Bitcoin Mining Project, which uses solar and wind power to mine bitcoins.

But is offsetting enough? "Using renewables is nice, but given that the supply is still scarce, this crowds out other energy uses which benefit society at large much more than competitive bitcoin mining," says Brosens.

The latest solution is a radical one: change the way blockchain works altogether. Vitalik Buterin, the creator of cryptocurrency network Ethereum, a platform that lets anyone build blockchain applications, announced last month that he would adopt a completely different way of doing transactions, known as "proof of stake".

He joins a growing chorus of voices who think that instead of proving a computer is trustworthy by taking out a "proof of work", they could vet themselves by placing a small amount of money into a fund, which they get back if the validation turns out to be real. "By showing they have resources invested, they show their work can be trusted," says Brosens. In a similar way to proof of work, it's difficult

to replicate by fraudsters.

This approach could have serious downsides, says Brosens: proof of stake could lead to biases towards those with more money. But no one's had a better idea yet. "In my opinion, the key really is to find ways of verification or mining that are less energy intensive," he says.

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