DIGGING FOR BITCOINS  

A handful of companies and groups of individuals are experts at mining virtual currencies in abandoned industrial settings in northern countries where electricity is cheap and abundant.  

BY JULIE DAVIS

T hey are miners. But they don’t have headlamps or pickaxes, and they don’t work several hundreds of metres underground. Instead, these miners work on gigantic farms filled with servers.

They spend their days solving complex mathematical problems, which requires significant computing power. The goal? Be the first to find the solution, so as to mine a new “block” that will validate new transactions in virtual currencies and add them to the blockchain, the register of every past transaction.

For their efforts, miners collect a commission on the transactions they validate and receive the coins that they mined. With Bitcoin, for example, each block created is worth 12.5 Bitcoins. “Commission varies based on supply and demand for miners’ services,” said Charles Hayter, co-founder of analytics firm CryptoCompare. Since about 114 blocks are added to the blockchain each day, mining generates nearly $11 million per day. Almost all currencies can be mined, but the ones that are the most popular are Bitcoin, Ethereum and, to a lesser extent, Litecoin and Monero.

In 2009, when only a few connoisseurs were interested in cryptocurrencies, mining was done by individuals using their personal computers to extract new Bitcoins. It was easy work. But not anymore. Since only the first person to solve the equation is compensated, miners quickly began a technological race to have the fastest, most powerful computer.

The material becomes obsolete very quickly, sometimes within just a few months,” said Charles Hayter. “New generations of machines and chips keep coming out.” Given that each machine costs between $800 and $1,100 and an average-sized farm has approximately 1,000 machines, it becomes very expensive rather quickly.

Mining therefore becomes the business of large companies that are able to make colossal investments. Once again, Chinese company Bitmain (currently not listed) is a global leader. Genesis Mining, a company founded in 2014 and based in Hong Kong and Iceland, is another big player, along with Canada’s Hive Blockchain.

Currently, the vast majority of Bitcoin mining (more than 70%) is occurring in China. “Certain provinces such as Sichuan and Inner Mongolia, which have lots of hydroelectric power, are home to gigantic mining farms in abandoned industrial hangars,” said Emin Gün Sirer, Bitcoin expert and professor at Cornell University.

Mining profitability decreases as the number of miners – and therefore competition – increases. “To fight against the exclusive stronghold of companies, individuals have started to come together to gather enough computing power and share costs,” said Campbell, Harvey, a cryptocurrency expert at Duke University. But the two largest mining sites, BTC.com and AntPool, are nevertheless owned by Bitmain.

“Surviving in such a difficult climate is not for the faint-hearted,” said Campbell. “The current context is favourable to big players and is leading to a concentration of the industry.” Some estimates say China’s Bitmain would monopolise nearly 45% of Bitcoin’s mining power or “hashrate”. This is rather ironic, since the idea behind cryptocurrencies was an ideal decentralisation of society.

“It is not a good idea for one single player to hold more than 25% of all resources,” said Sirer. “That player would decide to mine some blocks and not others, which would lead to the death of certain links in the blockchain, or even of the entire cryptocurrency altogether.” Furthermore, a player holding more than 51% of the hashrate of a blockchain, the blockchain’s security is no longer guaranteed – for example, this player may force the network to accept fraudulent transactions.

With this risk in mind, certain blockchains have modified their protocol. Monero, for example, has a mining algorithm that is open to all types of processors and ASIC-resistant, in order to encourage as many miners to participate as possible.  

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For miners, location is quite important. The amount of energy needed to run the powerful machines is the main cost. As a result, countries with cheap electricity or cold weather – which reduces the need to keep servers cool – are ideal spots. In addition to China, other places such as Iceland, Sweden, Estonia and Quebec are also top mining locations. Individuals have found that mining is no longer profitable, now that they are competing with large companies. The financial aspect is even more problematic given that mining profitability decreases as the number of miners – and therefore competition – increases. “To fight against the exclusive stronghold of companies, individuals have started to come together to gather enough computing power and share costs,” said Campbell. Harvey, a cryptocurrency expert at Duke University. But the two largest mining sites, BTC.com and AntPool, are nevertheless owned by Bitmain.