

BITFARMS IS a mining company based near Montreal in Canada' s Quebec province. Mining has a long history in this area. Quebec is the world' s second-biggest producer of niobium, an important ingredient in steel alloys, and the third-largest of titanium dioxide, used in products from spacecraft to toothpaste.

比特农场 (BITFARMS) 是一家位于加拿大魁北克省蒙特利尔附近的采矿公司。该公司在该地区有着悠久的采矿历史。魁北克是世界上第二大铌生产区，铌是钢铁合金的重要原料；魁北克还是第三大二氧化钛生产区，二氧化钛可用于生产的产品范围之广，大到航天器产品，小到牙膏。

Bitfarms, though, is a post-industrial sort of mining firm. Its racks of humming computers, crunching through zillions of cryptographic calculations every second, are designed to mine bitcoin and other cryptocurrencies. The location of Bitfarms is no accident. In 2016 Hydro-Quebec, the local electricity company, found itself flush with relatively cheap hydro-electricity and said it wanted to attract data centres like those run by Facebook or Google. That sparked a cryptocurrency gold rush.

不过，比特农场 (Bitfarms) 是一家后工业时代的挖矿企业。机架放上的计算机嗡嗡作响，每秒处理巨量的加密运算，主要用于挖比特币和其他一些加密货币。这家公司的选址并非偶然。2016年，当地的电力企业魁北克水电 (Hydro-Quebec) 发现拥有相对廉价的水电资源，表示有意引进Facebook 或 Google等企业的数据中心。此举引发了加密货币的淘金热潮。

Alex de Vries, an analyst at PricewaterhouseCoopers, a consultancy, helps to run a site called Digiconomist which keeps track of this business. He reckons that its total global revenues from such mining, even after bitcoin' s fall from its peak in 2017, are around \$4.5bn a year, mostly shared among a handful of Chinese firms that now dominate the cryptocurrency mining business.

咨询机构普华永道的分析师亚历克斯·德·弗里斯 (Alex de Vries) 协助运营一家跟踪这一行业状况的网站Digiconomist。他估计，即便在比特币从2017年的峰值下跌之后，挖矿业的一年的全球营收也在45亿美元左右，其中大部分集中在目前主导加密货币采矿业务的少数几家中国企业手中。

The most striking statistic is the sheer amount of electricity needed to run the system. Mr de Vries estimates that bitcoin mining consumes at least 22 terawatt hours of electricity a year, and probably as much as 73TWh, roughly the same amount as Austria does. Ethereum, the second-most-popular cryptocurrency, eats up a further 21TWh.

最引人注目的数据是运行该探矿系统所需的电力。德·弗里斯估计，开采比特币每年消耗的电力至少是22太瓦时，也有可能高达73太瓦时（TWh），与奥地利一国的耗电量大致相当。第二大加密货币以太坊（Ethereum）则要消耗21TWh的电力。

This phenomenal energy hunger is implicit in the nature of cryptocurrency mining. Miners are responsible for maintaining the blockchain, but anybody can set themselves up as one, so there needs to be a way to deter frivolous or malicious operators. In bitcoin's "proof of work" system, miners demonstrate their commitment by using computer power (and therefore electricity) to supply the answer to a mathematical puzzle. Whoever solves it first is rewarded with some newly minted bitcoin.

这种惊人的能源消耗是加密货币挖掘性质决定的。矿工的责任是维护区块链，但任何人都可以自己开发为一个区块链，因此，需要设法阻止无聊的或恶意的操作人员。在比特币的“工作量证明”系统中，矿工们通过使用计算机算力（以及相应的电力）为数学难题提供答案，以此来证明他们的承诺。先解决问题的人会得到一些新挖掘的比特币作为奖励。

The result is a Red Queen's race, where miners must run just to stand still. The best way of winning is to buy ever more and ever faster computers to solve the puzzles. But the system is designed to be self-adjusting, to keep the average rate at which new blocks are generated at one every ten minutes. The more computer power miners throw at the problem, the harder the task becomes. In the long run, says Mr de Vries, the cost of mining a block should tend towards the real-world value of the 12.5 bitcoin reward. At current prices that is about \$80,000, which buys a lot of electricity.

这样结果是导致一场红皇后式竞赛，矿工们必须要向前奔跑，而非停滞不前。获胜的最佳方式是购买更多运算速度更快的计算机来解决难题。不过，区块链系统能自我调整，保持每十分钟生成一个新区块的平均速率。矿工用于解决问题的计算机算力越多，探矿的任务就会变得越发困难。德·弗里斯表示，从长远来看，开采区块的成本应该接近于12.5比特币奖励的实际价值。目前的价格约为8万美元，用来购买

大量电力。

The reward money has created an entire industry. In the early days most mining was done by individuals on home computers, but it soon moved to more efficient computer-graphics chips. Now it is done in vast data centres full of chips so specialised they can do nothing else.

奖励的资金创造一个完整的行业。在早期，大多数挖矿行为都是由个人在家用电脑上完成的，不过很快就转向了更高效的计算机图形芯片。如今，这个工作在大量数据中心里进行，由专门用于挖矿的芯片的执行。

The biggest mining company, Bitmain, founded in 2013, is privately held, so numbers are hard to come by, but according to one estimate from Bernstein, a Wall Street research firm, Bitmain may have made a profit of \$3bn-4bn last year. It is planning to float on the stockmarket before the end of this year.

最大的矿业公司比特大陆 (Bitmain)
成立于2013

年，是一家私营企业，很难获得相关数据。不过，根据华尔街研究机构伯恩斯坦 (Bernstein) 的估计，比特大陆去年的盈利可能在30亿至40亿美元。该公司计划在2018年年底前在股市上市。

The dominance of a few big firms in mining worries many crypto fans. They are aware that anyone who controls more than half the total mining capacity in a cryptocurrency is able to manipulate its blockchain, a so-called "51% attack" . Several smaller cryptocurrencies have already fallen victim to such attacks.

少数几家大公司在挖矿行业的主导地位让许多加密爱好者感到担忧。他们意识到，任何控制加密货币总开采量一半以上的人都能操纵其区块链，即所谓的“51%攻击”。一些规模较小的加密货币沦落成为此类攻击的牺牲品。

For most outsiders, the bigger worry is the current system' s voracious power consumption. After its initial enthusiasm, Hydro-Quebec was so overwhelmed that it has had to call a moratorium on new applications for cryptocurrency mining. It is unclear where most mining operations obtain their electricity. But the biggest cryptocurrency farms are in China, where most of the electricity is generated by dirty coal-fired power stations.

对大多数外行人来说，更大的担忧是当前探矿系统的耗费了巨大的电量。在最初的热情之后，魁北克水电公司（Hydro-Quebec）不堪重负，不得不叫停开采加密货币的新程序。目前尚不清楚大多数挖矿企业从何处获得电力。不过，最大的加密货币农场在中国，大部分电都是由不清洁的火电站生产的。

Mindful of such concerns, some cryptocurrency developers are looking for alternative ways to secure their products, but there is little agreement on how to do it. The most popular idea is a “proof of stake” system, in which a miner’s chance of being able to add a block depends on how much of the cryptocurrency he already owns, removing the need for elaborate power-hungry calculations. But giving yet more currency to those that have the most has a whiff of plutocracy about it, and many users object.

对于这些担忧，一些加密货币开发机构正在寻找其他替代方法来维护其加密货币，不过，尚未就实现方式达成一致。最流行的想法是“权益证明”系统，即矿工能添加一个区块的机会取决于所拥有的加密货币量，不需要复杂的耗电计算。但是，将更多的货币给予那些拥有最多财富的人，会带有些许财阀政治的味道，众多用户对此表示反对。

Even the miners themselves are making contingency plans. Bitmain, for instance, is planning to diversify by launching a new series of chips designed for machine learning. Bitfarms says that bitcoin mining is merely a transient project to fund its longer-term goal: enabling business applications for the blockchains that underlie cryptocurrencies.

就连矿工自己也在制定应急计划。例如，比特大陆计划通过推出专为机器学习设计的新系列芯片以实现业务多样化。比特农场表示，比特币采矿仅是一个为其长期目标提供资金的短期项目：为基于加密货币的区块链商用业务。

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