Bitcoin mining update: August 2024

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Key Takeaways

- Bitcoin miners have driven significant positive performance in the WisdomTree Blockchain UCITS ETF year-to-date
- Despite volatility introduced by the bitcoin halving back in April, miners have adapted well to the market environment
- So far, firms that have been nimble, scaling up computing capacity and efficiency have outperformed, as many of these firms were unloved going into the halving

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In the past, we have discussed the impact of bitcoin miners on the volatility of blockchain equity ETFs and highlighted WisdomTree's balanced approach to mitigating this risk while offering pure exposure to blockchain technology via equities. We also examined the effects of the bitcoin halving on digital asset miners, a key component of these portfolios.

This year has been eventful for the digital asset space, with bitcoin miners emerging as an 'overweight' in the WisdomTree Blockchain UCITS ETF due to performance. These miners fall within the 'blockchain enablers' category of our proprietary classification system, which sets allocations among various types of exposures in the blockchain technology domain. Descriptions of the two classifications are as follows:

Blockchain Enablers: Companies that provide blockchain infrastructure or partake directly in cryptocurrency mining. Cryptocurrency mining consists of validating blocks of transactions on proof-of-work blockchains to yield a minted block subsidy. Blockchain infrastructure includes, but is not limited to, specialised hardware or high-performance computing infrastructure for the purpose of cryptocurrency mining, or secure cryptocurrency offline storage.

Blockchain Engagers: Companies that offer blockchain and cryptocurrency products and services. These include, but are not limited to, cryptocurrency trading platforms and exchanges, cryptocurrency banking, and other blockchain based digital ledger technology and service offerings.
Having set the allocation to enablers as roughly 45% in May at the last rebalance – the allocation has now moved to over 50% given the strong performance of a few holdings.

Figure 1: WisdomTree Blockchain UCITS ETF year-to-date performance attribution, top and bottom five

Ticker	Name	Classification	Avg % Wgt	Total Return (%)	Contribution to Return (%)
CLSK US	**CLEANSPARK INC**	**Blockchain Enablers**	**10.77**	**36.81**	**11.25**
HOOD US	ROBINHOOD MARKETS INC - A	Blockchain Engagers	7.58	58.87	3.54
IREN US	**IRIS ENERGY LTD**	**Blockchain Enablers**	**4.04**	**29.93**	**2.66**
WULF US	**TERAWULF INC**	**Blockchain Enablers**	**3.28**	**71.25**	**1.67**
COIN US	COINBASE GLOBAL INC -CLASS A	Blockchain Engagers	8.99	22.26	1.65
MSTR US	MICROSTRATEGY INC-CL A	Blockchain Engagers	2.55	-12.47	-1.22
SQ US	BLOCK INC	Blockchain Engagers	4.98	-22.56	-1.37
CAN US	CANAAN INC	Blockchain Enablers	1.25	-57.68	-1.64
BITF US	**BITFARMS LTD/CANADA**	**Blockchain Enablers**	**4.13**	**-14.84**	**-3.26**
RIOT US	**RIOT PLATFORMS INC**	**Blockchain Enablers**	**6.44**	**-39.75**	**-3.40**

Source: Bloomberg as of 1 August 2024. Bolded blockchain enablers represent bitcoin miners. **Historical performance is not an indication of future performance and any investment may go down in value.**

So far, in a volatile year that has seen the bitcoin halving, these firms have driven much of the fund's positive performance. Looking at year-to-date performance attribution in Figure 1, we see some notably strong performers and contributors in the enablers group—contributing to a year-to-date fund performance number of over 10%. Likewise, you'll notice a few at the bottom of the list.

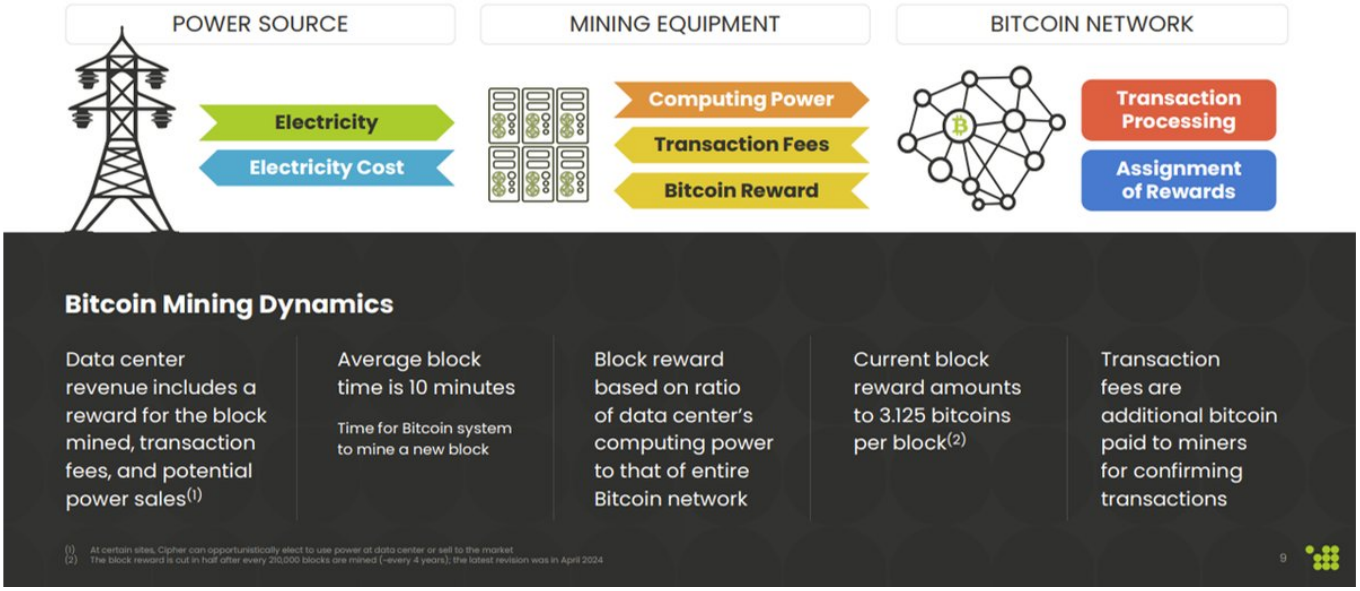
There has been some performance dispersion in this group. This is primarily attributed to the bitcoin halving, the event in which bitcoin rewards were cut in half in April of this year – effectively reducing bitcoin miner revenues by half, holding all else constant. Let's dive into more detail about the bitcoin mining ecosystem and why some of these firms might have emerged as beneficiaries of such an event.

Bitcoin mining review

Bitcoin miners bundle transactions into blocks and add these blocks to the Bitcoin blockchain. They receive a reward in the form of newly minted bitcoin for doing so, and transaction fees are denominated in bitcoin. This incentivises the continued validation of network transactions and the sanctity of the blockchain. To accomplish this, these firms run 'bitcoin mining nodes', i.e. computers optimised for this 'mining' process, which can require advanced hardware as it is quite computation-intensive.

As a result, the overall bitcoin mining business model is relatively simple – the more computational power you have available, the more computation you can do to mine more bitcoin and receive the rewards (e.g. newly minted bitcoin and transaction fees). The cheaper and more efficiently this can be done, the better the margins.

Figure 2: Bitcoin mining business model



Source: Cipher Mining Q1 2024 Earnings Call Presentation.

Mining capacity is measured in exahashes per second (EH/s). Firms with more EH/s have greater mining capacity – and therefore mine at a greater scale, tending to produce more bitcoin.

The **efficiency** of the hardware tends to be reported in terms of joules per terahash (J/TH), while energy input costs are in dollars per kilowatt hour ($/kWh). With some scale conversions and arithmetic, one can estimate the miners' cost of producing bitcoin and profit margin based on prevailing prices. Miners with higher margins tend to have cheaper energy costs and more efficient computing hardware.

Figure 3: Bitcoin miner capacity and efficiency

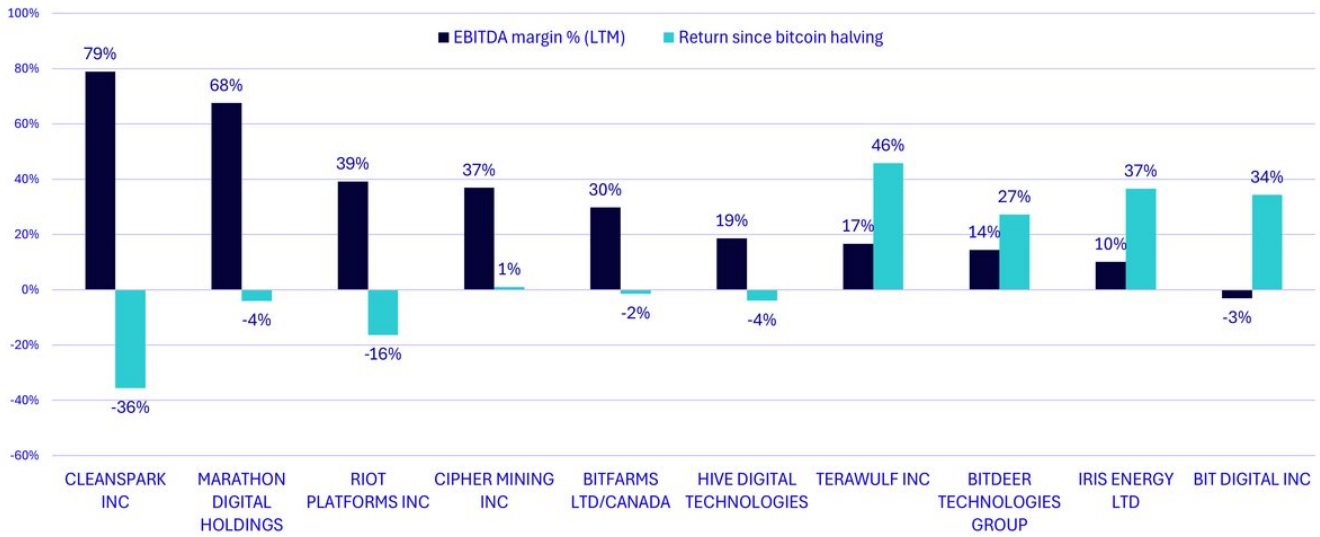
Company	Current J/TH	Current EH/s	Planned 2024YE EH/s	Expansion
BITFARMS LTD/CANADA	25	7	21	200%
IRIS ENERGY LTD	25	10	30	200%
BIT DIGITAL INC	25	2.8	6	114%
CLEANSPARK INC	>25	16.4	32	95%
TERAWULF INC	28	8	13	63%
HIVE DIGITAL TECHNOLOGIES	low to mid 20's	5	8	60%
MARATHON DIGITAL HOLDINGS	24.5	31.5	50	59%
RIOT PLATFORMS INC	23.5	22	31	41%
CIPHER MINING INC	25	7.7	9.3	21%
BITDEER TECHNOLOGIES GROUP	29	21	25	19%

Source: Company filings and earnings calls as of 1 August 2024. EH/s represents exahash per second and represents bitcoin mining scale and capacity. J/TH represents joules per terahash and represents bitcoin mining efficiency.

Glassnode estimates the average cost of mining a bitcoin to be roughly $30,000 based on their regression model, offering a benchmark on input costs1. TeraWulf's reported numbers align with this estimate, with an average cost per bitcoin of $29,000 in Q1 20242. This cost was significantly below the bitcoin price for most of the period, allowing for a substantial profit margin. Post-halving, TeraWulf estimates their costs to be around $40,000, but they have yet to report the latest figures3. Given the volatility of bitcoin prices, which directly impact miners' revenues, firms face challenges in managing operational and capital expenditures to generate consistent revenues and grow their businesses over the long term. Some firms accumulate too much debt and struggle to operate when bitcoin prices fall below their operational costs, resulting in negative margins. This is especially problematic when debt service payments are high, energy prices are elevated, and bitcoin prices are low. Companies must carefully manage their resources to maintain profitability through market fluctuations while investing in future growth.

Performance Recap

Figure 4: Bitcoin Miner Returns and earnings before interest, taxes, depreciation, and amortisation (EBITDA) Margins



Source: Bloomberg, Koyfin as of August 8, 2024. The bitcoin halving took place on April 20, 2024.
Historical performance is not an indication of future performance and any investment may go down in value.

The bitcoin mining sector has experienced notable price dispersion and volatility. Surprisingly, smaller firms with historically lower margins have outperformed since the bitcoin halving, as shown in Figure 4. This counterintuitive trend raises the question: how could this be?

Post-halving, lower-margin firms have adapted well to the changing market environment. Despite market expectations of struggle, these firms have thrived. Iris Energy, TeraWulf, and Bit Digital are leading the charge, which has expanded their capacity to support the growing demand for AI model training and other

high-performance computing (HPC) tasks. The computational tasks of bitcoin mining and AI training are similar, allowing these companies to use their hardware for multiple purposes. This strategic diversification has opened the door to new revenue streams, tapping into new sources of demand.

Within their bitcoin mining segment, these companies have focused on improving efficiency. Iris Energy, for example, aims for efficiency as low as 16 J/TH, targeting a bitcoin production cost of around $17,000 as they expand operations with better equipment and cheaper energy sources4. Iris Energy and Bit Digital both plan to scale their EH/s by 2-3x, demonstrating their commitment to expanding their mining capabilities.

Other firms are also scaling but have taken different approaches. Increased competition has led some to consider acquisitions, as seen with Riot Platforms attempted hostile takeover of Bitfarms5. Riot's failed bid resulted in a sell-off driven by concerns about meeting their year-end hash power goals.

On the other hand, large incumbents, such as CleanSpark and Marathon Digital, entered the halving with expectations to outperform, given their strong financial profiles. Notably, CleanSpark benefited from market strength before the halving, but its performance has since declined.

Another wrinkle that tends to impact performance is that these firms have different strategies for managing their balance sheets. For example, Marathon Digital has adopted a 'hodl' strategy, choosing to retain mined bitcoin rather than selling it. This makes Marathon one of the largest bitcoin holders among publicly traded firms, second only to MicroStrategy, with over twice the bitcoin holdings of any other miner6. With a large portion of their assets in bitcoin, their overall valuation fluctuates with bitcoin prices, sometimes more drastically than firms that sell most of the bitcoin they mine.

Since the halving, bitcoin miners have experienced volatility, but as paths become clearer for future revenues, as they increase efficiency and scale up operations, concerns about their ability to compete have diminished. The overall hash rate of the Bitcoin network has declined since the halving, indicating a reduction in market competitiveness. This suggests that the least efficient miners, likely not publicly traded, may have exited the competition, leaving more room for publicly traded digital asset miners to thrive.

Conclusion

As we move past the initial months following the bitcoin halving, clear winners in the bitcoin mining ecosystem have not yet emerged, but those ramping up capacity and optimising operations appear poised to outperform in the post-halving phase of the market cycle. Regarding equity allocations in blockchain exposure, this sector demands continued due diligence due to anticipated higher volatility and ongoing M&A activity. Despite recent fluctuations in bitcoin prices, the outlook remains bright, given low production costs and prudent operational management. Given the critical role of mining in the bitcoin ecosystem, this segment will continue to be an essential part of a blockchain technology investment strategy.

1 https://studio.glassnode.com/workbench/btc-difficulty-regression
2 Q1 2024 Terawulf Earnings Call
3 Q1 2024 Terawulf Earnings Call

4 Iris Energy Q3 2024 Earnings Presentation, May 15, 2024.
5 https://blockworks.co/news/riot-mining-hostile-bid-bitfarms-acquisition
6 https://bitcointreasuries.net/

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