



Bitcoin mining Report

Strategic, operational, and financial comparison

Quarterly industry report - based on Q1 2023 & June 2023

As of August 1st, 2023

Disclaimer: The content covered in this report is **NOT** to be considered as investment **advice**

1 Bitcoin mining companies Executive summary

Selected companies



Strategic comparison

The most prominent strategic decisions for BTC mining companies can be divided into treasury management, vertical integration, and geographical diversification.

Treasury management

Most Bitcoin mining companies try to hold their mined Bitcoins long-term. To counter liquidity issues and pay for short-term liabilities, most miners had to deviate from this strategy, but are slowly starting to accumulate BTC again.

Vertical integration

While publicly-listed mining companies usually own their data center infrastructure, Bit Digital, and Marathon, and Argo rely on being hosted. This increases flexibility at the cost of higher OpEx. Two out of the twelve companies own and operate power plants.

Geographical diversification

All mining companies diversify their operations over at least two locations. Five companies operate in multiple countries.

Operational comparison

We compare the current hash rate, hash rate growth, expected hash rate, and hash rate per USD.

Publicly listed Bitcoin mining companies have a cumulated hash rate of 94,7 EH/s, up ~46% since December '22. This growth is similar to the total network hash rate increase of 48% over the same period.

With 43.4 EH/s combined, Core Scientific, Marathon and Riot make up ~50% of the cumulated listed mining company hash rate production.

Based on historical build-out speed and already installed miners, current hash rate goals appear to be achievable by EoY '23.

The Hash rate per USD of market value currently ranges from 3 GH/USD (Hut 8 and Riot) to 93 GH/USD (Stronghold), with a median of 24 GH/USD.

Data sources

- Annual and Quarterly Reports
- Public Announcements

Financial comparison

Revenue, profit margin, Bitcoin production cost, and liquidity indicators are the focused areas in this financial comparison.

With all companies having a positive gross profit* margin, the average value was +34% (excluding depreciation).

The reported operating cost of 'producing' one Bitcoin ranges from \$6.5k (Cipher) to \$17.6k (Marathon), with an average of \$14,1k.**

When compared to Q4 2022, companies were able to deleverage their balance sheets and decrease their average (weighted) debt-to-equity ratios from 62% to 42%. In general, Bitcoin mining companies seem to be more aware of liquidity issues.

STRATEGIC COMPARISON

This section gives an overview of selected key differentiators of listed mining companies regarding their business model and strategy.

- Overview
- Market capitalization
- Bitcoin holdings
- Data center locations
- Vertical integration
- Price performance

FINANCIAL COMPARISON

This section gives an overview of selected key differentiators of listed mining companies regarding their operations.

- Overview
- Profitability
- Cost-per-Bitcoin
- Debt-to-Equity
- Current ratio

OPERATIONAL COMPARISON

This section gives an overview of selected key differentiators of listed mining companies regarding their operations.

- Overview
- Hash rate
- Hash rate distribution
- Expected Hash rate growth
- Hash rate per USD

COMPANY OVERVIEWS

This section gives detailed overviews about each company's business model, sites and KPIs.

APPENDIX

This section gives additional general information about Bitcoin, hash rate development, and Bitcoin mining.

- Bitcoin supply
- Bitcoin hash rate
- Mining profitability
- Electricity cost
- Mining hardware cost

STRATEGIC COMPARISON

This section gives an overview of selected key differentiators of listed mining companies regarding their business model and strategy.

OPERATIONAL COMPARISON

FINANCIAL COMPARISON

COMPANY OVERVIEWS

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Overview on 12 largest publicly-listed Bitcoin mining companies by alphabetical order

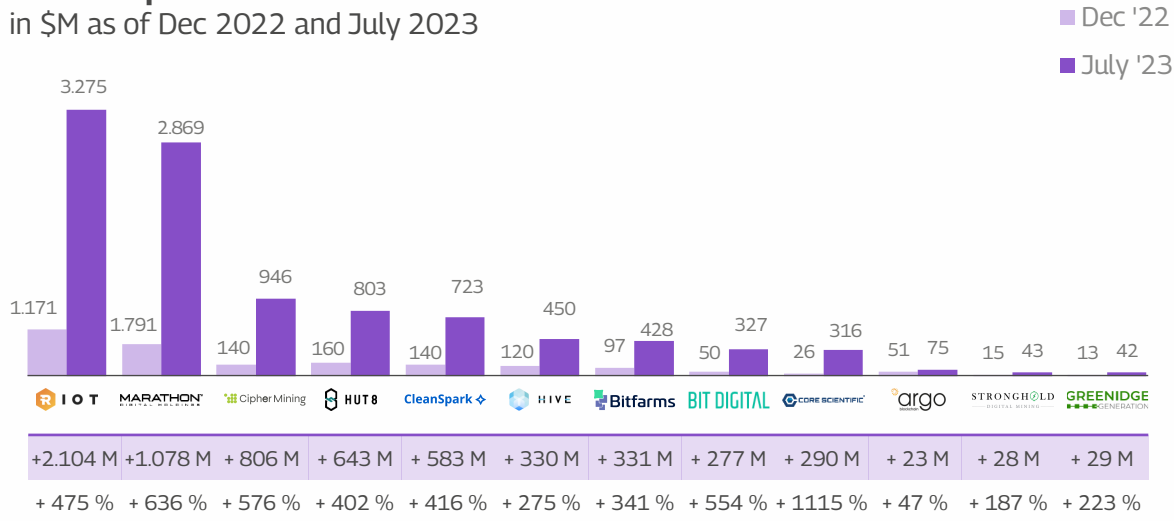
Overview

Miners, sorted alphabetically	argo	BIT DIGITAL	Bitfarms	Cipher Mining	CleanSpark	CORE SCIENTIFIC	GREENIDGE GENERATION	HIVE	HUT 8	MARATHON	RIOT	STRONGHOLD
Headquarter												
Ticker	ARBK	BTBT	BITF	CIFR	CLSK	CORZ****	GREE	HIVE	HUT	MARA	RIOT	SDIG
Market Cap (\$M)*	\$75M	\$327M	\$428M	\$946M	\$723M	\$316M	\$42M	\$450M	\$803M	\$2,869M	\$3,275M	\$43M
Hash rate (EH/s)**	2.5 EH/s	1.8 EH/s	5 EH/s	6.7 EH/s	6.7 EH/s	15 EH/s***	2.5 EH/s	3.3 EH/s	2.6 EH/s	17.7 EH/s	10.7 EH/s	4 EH/s
Bitcoin holdings**	44 ₿	485 ₿	549 ₿	417 ₿	529 ₿	0 ₿	0 ₿	1,957 ₿	9,136 ₿	12,538 ₿	7,250 ₿	39 ₿
Number of facilities**	3	5	11	3	5	7	2	7	3	2	1	2
Vertical Integration**	Medium	Low	Medium	Medium	Medium	Medium	High	Medium	Medium	Low	Medium	High

Marathon and Riot are the two largest publicly-listed mining companies. They make up 60% of the total market cap

Market capitalization

Market capitalization
in \$M as of Dec 2022 and July 2023



Absolute change (\$) and relative change (%)

Insights & key takeaways

The Bitcoin mining industry lost a total of over \$3.3B (~63%) in market value during Q4 2022. Since beginning '23, it increased by over 580% and recently surpassed the \$10B mark.

Core Scientific, due to liquidity issues filed for bankruptcy in December '22. However, since then, they restructured and attracted additional funds, leading to a market cap growth of over 1100%.

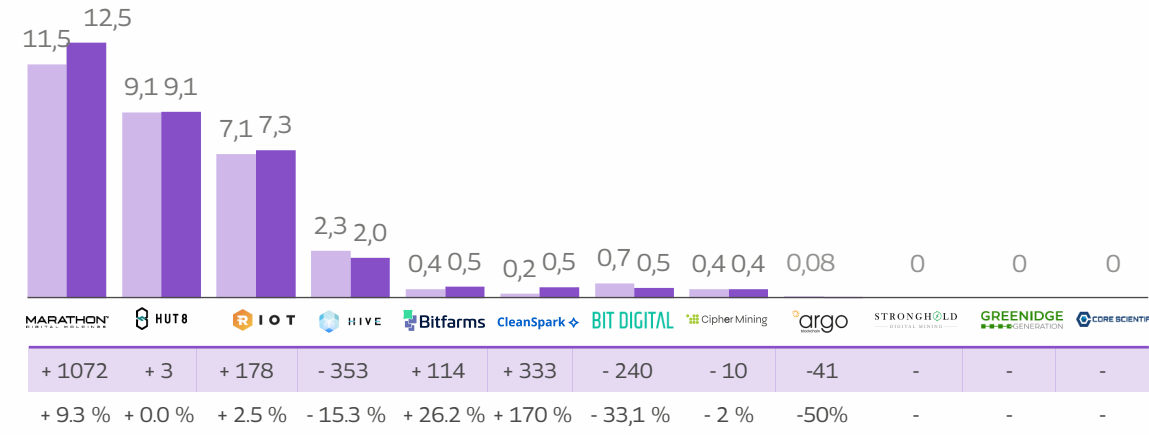
Largest nominal growth was observed by Riot (\$2.1B). It seems to be determined by significant price per share increase of over 5x.

Marathon is currently the second-largest publicly-traded Bitcoin holder after MicroStrategy*

Bitcoin holdings

Bitcoin holdings

in 1,000 BTC as of Mar 2023 and June 2023



Absolute change (BTC) and relative change (%)

Insights & key takeaways

























Marathon, Hut 8 and Riot are among the top 10 largest institutional holders of BTC.

During Q2 2023, mining companies increased their Bitcoin holdings by 3.4% (1066 ₿). This may be mainly driven by increasing confidence in rising Bitcoin prices.

Mining companies are still relying on a 'sell-most' approach selling on avg. ~90% of mined BTC. Marathon, Bitfarms, Riot, and CleanSpark are currently shifting their strategy, effectively growing their BTC holdings.

Most companies try to diversify their operations over multiple facilities. Four have operations outside of North America

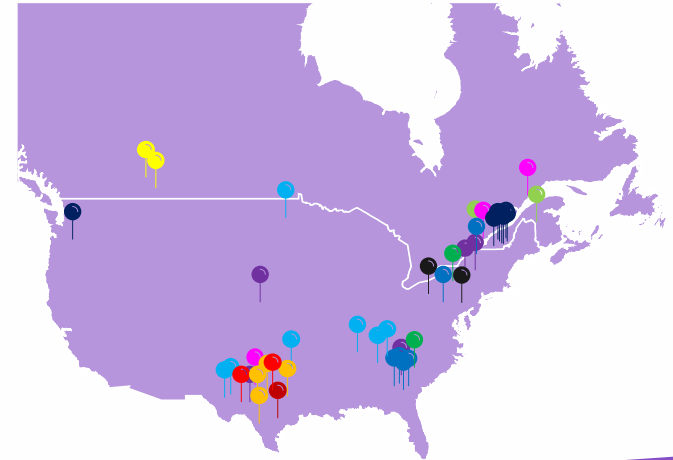
Data center locations

Company	Active	Planned	
 argo	3	0	
 BIT DIGITAL	6	0	
 Bitfarms	11	0	
 CleanSpark	8	0	
 CORE SCIENTIFIC	7	1	
 GREENIDGE	2	0	
 HIVE	7	0	
 HUT8	2	0	
 Cipher Mining	4	0	
 MARATHON	4	4	
 RIOT	1	1	
 STRONGHOLD	2	1	



States with the most facilities

State/Province	Active	Planned
Quebec CA	10	
Georgia, US	8	
Texas, US	9	5
New York, USA	3	
North Carolina, US	3	

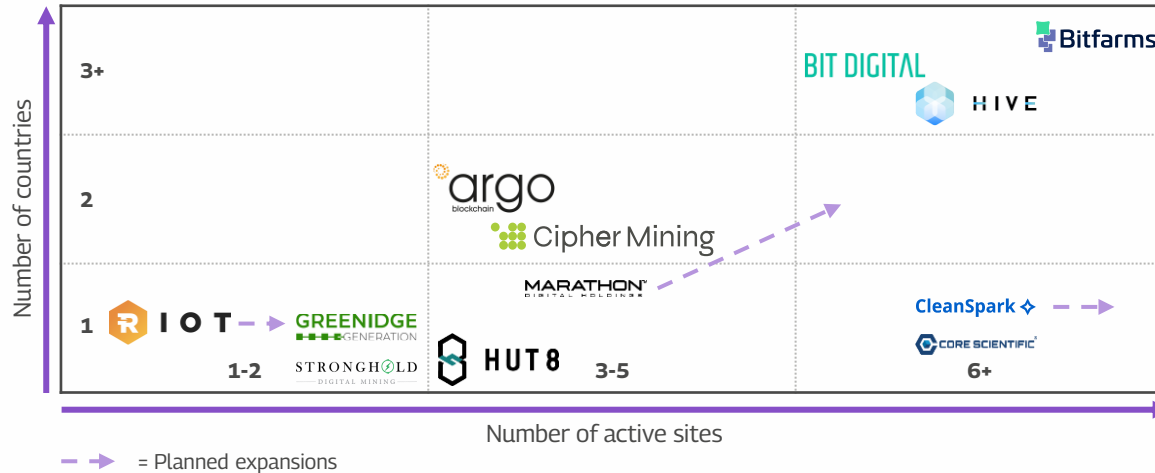


Most companies plan to expand their operations inside their current countries of operations

Data center locations

Number of countries and active sites

Overview as of June 2023



Insights & key takeaways

With 11 operating facilities, Bitfarms is the most geographically diversified Bitcoin mining company.

Five out of the twelve Bitcoin mining companies currently operate in two or three facilities.

Marathon plans a large geographical expansion, increasing its site count from four to six sites across the United States and launching a site in Abu Dhabi, UAE.

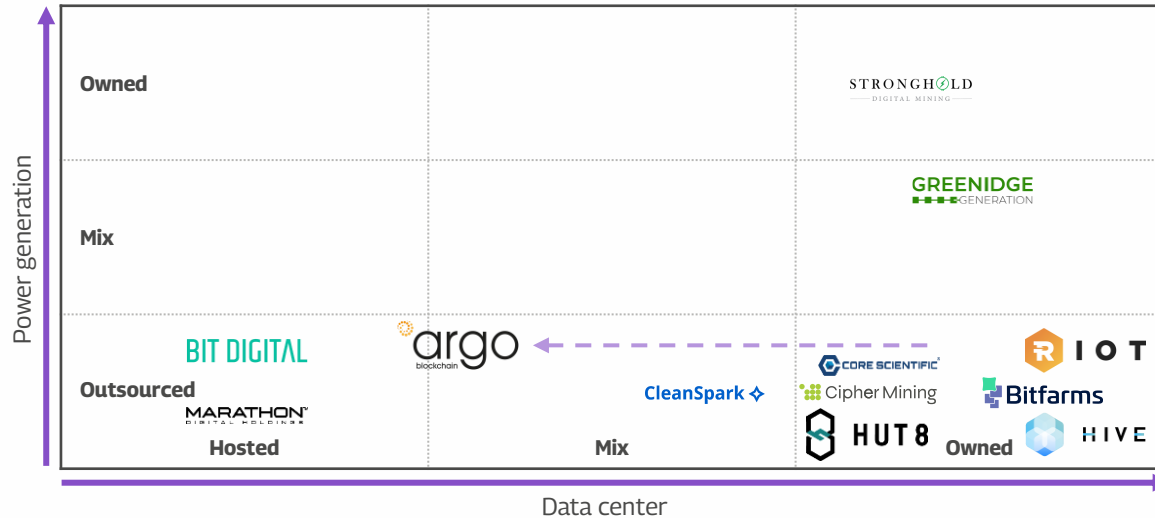
Most mining companies operate in proprietary data centers but do not own power plants

Vertical integration

Vertical integration

Overview as of June 2023

Change since Q4 2022



Insights & key takeaways

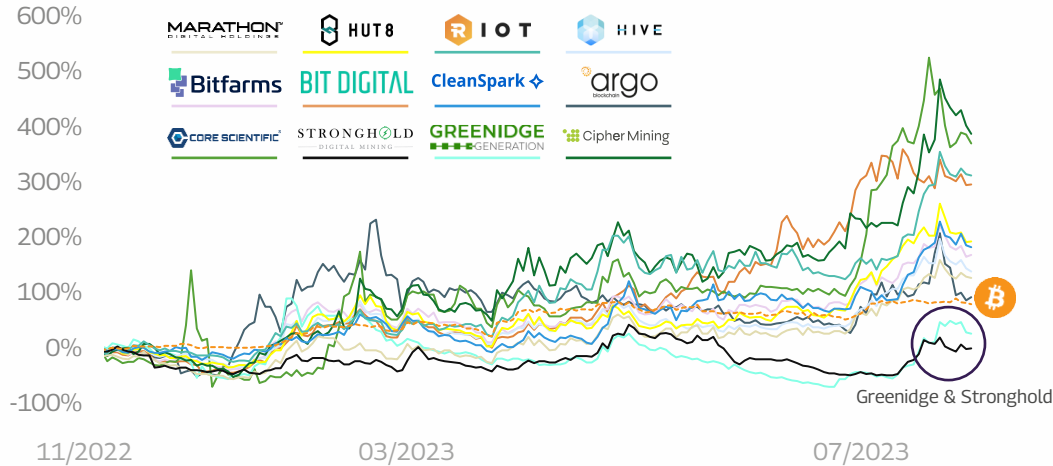
The benefits of self-generating electricity to power BTC miners are the independence of third parties and lower electricity costs. However, the cost per BTC does not seem to be significantly lowered by owning a power plant - on average for vertically integrated companies it is \$13.7k, compared to \$14.2k for companies buying the electricity.

In December, Argo sold its Texas-located 'Helios' facility to Galaxy Digital. The parties have agreed on a two-year hosting agreement.

Since the lowest point in November 2022, BTC price rose 79%, while stock prices of miners surged by 180%

Price performance

Price performance of mining stocks and Bitcoin
in %, relative to Nov 21st 2022



Insights & key takeaways

Miners' stocks seem to be performing as leveraged BTC position, over proportionally to Bitcoin price growth.

From the sample of BTC mining firms, only Stronghold's and Greenidge's stock price underperformed BTC price increase since November 2022. This seems to be heavily driven by their financial situation.

STRATEGIC COMPARISON

OPERATIONAL COMPARISON

This section gives an overview of selected key differentiators of listed mining companies regarding their operations.

FINANCIAL COMPARISON

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Publicly-listed mining companies mined a total of 16k BTC during Q2 '23, up 2 % quarter-over-quarter

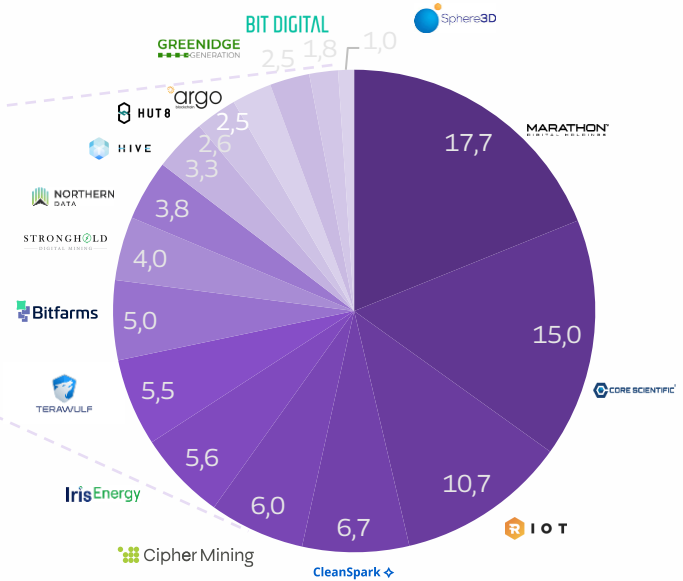
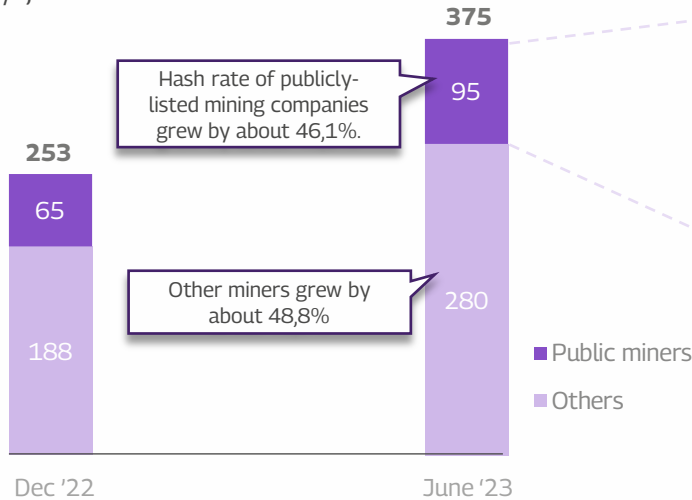
Overview

Miners, sorted alphabetically	argo	BIT DIGITAL	Bitfarms	Cipher Mining	CleanSpark	CORE SCIENTIFIC	GREENIDGE GENERATION	HIVE	HUT 8	MARATHON	IOT	STRONGHOLD DIGITAL MINING
Hash rate (EH/s)*	2.5 EH/s	1.8 EH/s	5 EH/s	6.0 EH/s	6.7 EH/s	15 EH/s**	2.5 EH/s	3.3 EH/s	2.6 EH/s	17.7 EH/s	10.7 EH/s	4 EH/s
Hash rate per \$ (GH/USD)*	33.3	5.4	12.4	7.1	9.3	47.4	60	7.3	3.2	6.1	3.2	92
2023 Goal (EH/s)*	2.8 EH/s	2.6 EH/s	6.0 EH/s	8.2 EH/s	16 EH/s	-	3.6 EH/s	6.0 EH/s	5.6 EH/s	23 EH/s	12.5 EH/s	4 EH/s
Bitcoin mined (BTC) in Q2	456 ₿	318 ₿	1,223 ₿	1,259 ₿	1,624 ₿	3,470 ₿	698 ₿***	837 ₿	399 ₿	2,926 ₿	1,775 ₿	618 ₿***
Bitcoin holdings (BTC)*	44 ₿	485 ₿	549 ₿	427 ₿	529 ₿	0 ₿	0 ₿	1,957 ₿	9,136 ₿	12,238 ₿	7,250 ₿	39 ₿

The total network hash rate grew by about 48% since December, public mining companies grew at a similar pace – an increase of 46%

Hash rate distribution

Total BTC network hashrate
In EH/s, Dec 2022 & June 2023

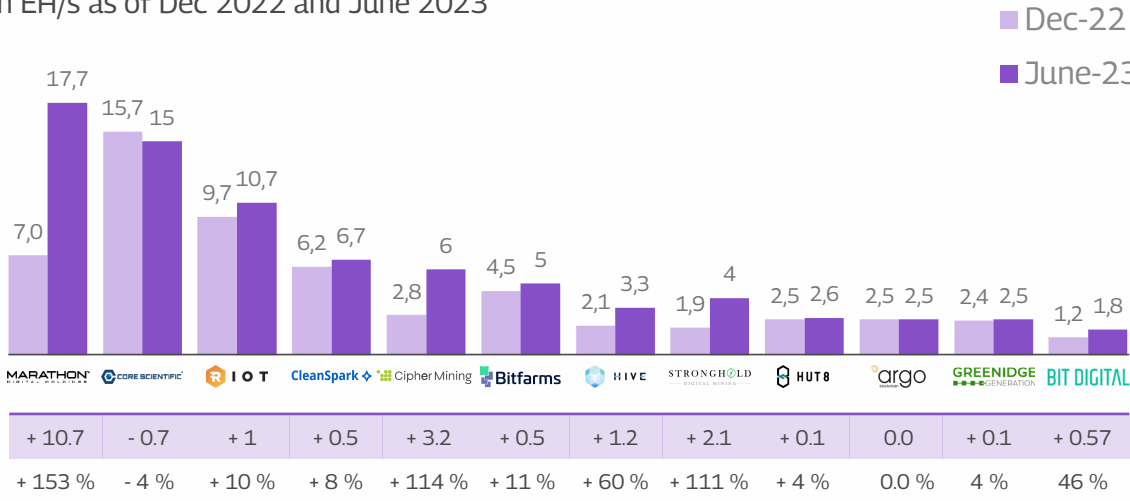


Marathon outperformed the total network growth by over 3x in the given period, increasing its hash rate to 17.7 EH/s

Hash rate

Hash rate

in EH/s as of Dec 2022 and June 2023



Absolute change (EH/s) and relative change (%)

Insights & key takeaways

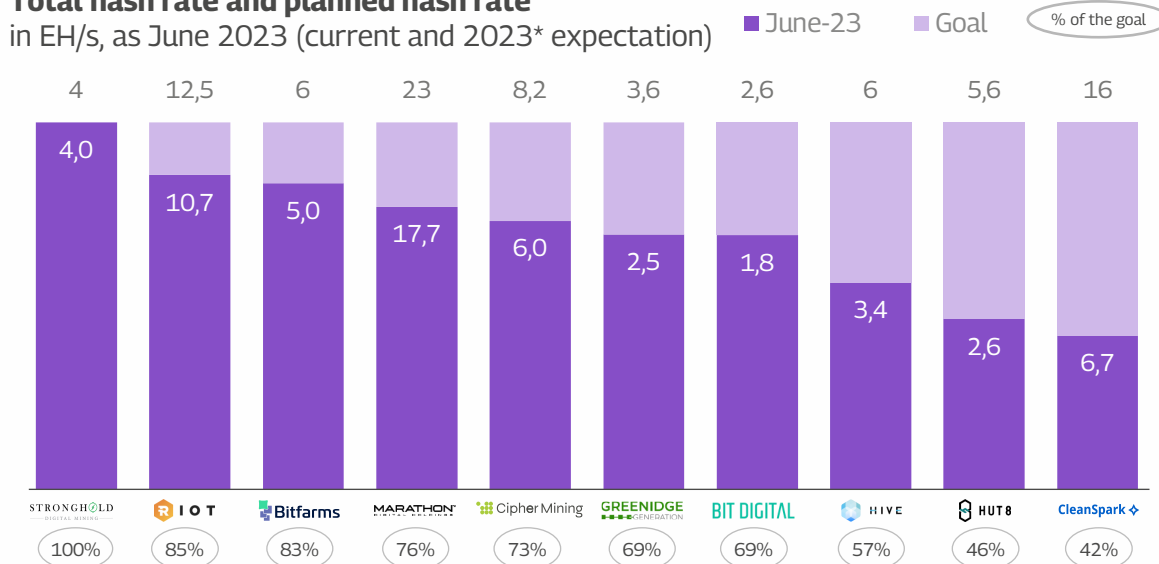
Public mining companies grew their total hash rate by 46%. While publicly-listed miners have outperformed the total network growth rate in the past, they slightly underperformed in this period.

Despite filing for bankruptcy in late December, Core Scientific is still one of the largest Bitcoin mining companies by hashrate. It has been recently overtaken by Marathon, whose goal is to reach 23 EH/s in late-2023.

Based on historical build-out speed and installed miners, current goals seem to be achievable by EoY '23

Expected hash rate growth

Total hash rate and planned hash rate
in EH/s, as June 2023 (current and 2023* expectation)



Insights & key takeaways

Based on historical build-out speed, current hash rate, and build-out pipeline, Greenidge, Marathon, Cipher, and Riot are expected to achieve their goals in 2023.

Hive and Stronghold achieved their EoY '22 hash rate goals in Q1'23. Hive announced a new '23 goal; Stronghold did not provide any updates.

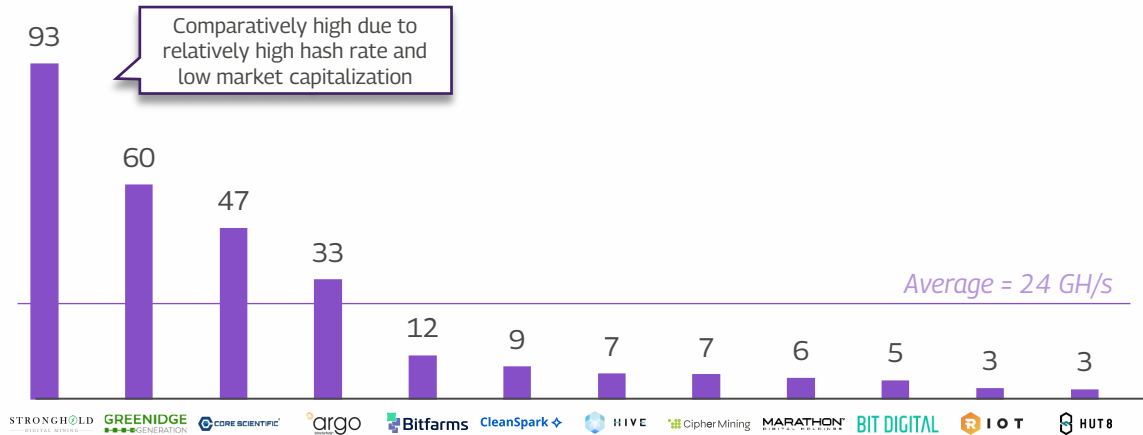
After achieving EoY 2022 goal this January, Marathon increased its goal to 23 EH/s. Bitfarms, which missed its EoY 2022 goal of 5 EH/s only by 10%, increased its goal conservatively to 6 EH/s.

Due to Core Scientific's market cap decline in '22, its hash rate per USD is currently ~3.9x times higher than the average

Hash rate per USD

Hash rate per USD

in GH/s per USD as of June 2023



Insights & key takeaways

Bitcoin mining companies operate on average about 24 GH/s per USD of total market capitalization.

With around 3 GH/s per USD of market cap, Hut 8 seems to be the 'most expensive' Bitcoin mining company. However, Hut 8 does not only operate Bitcoin miners but is also active in high-performance computing (HPC).

Stronghold, Greenidge, and Core Scientific offer the highest mining power in relation to their current market valuations.

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Despite the harsh environment, most of the mining companies have finished the Q1 2023 with solid financials

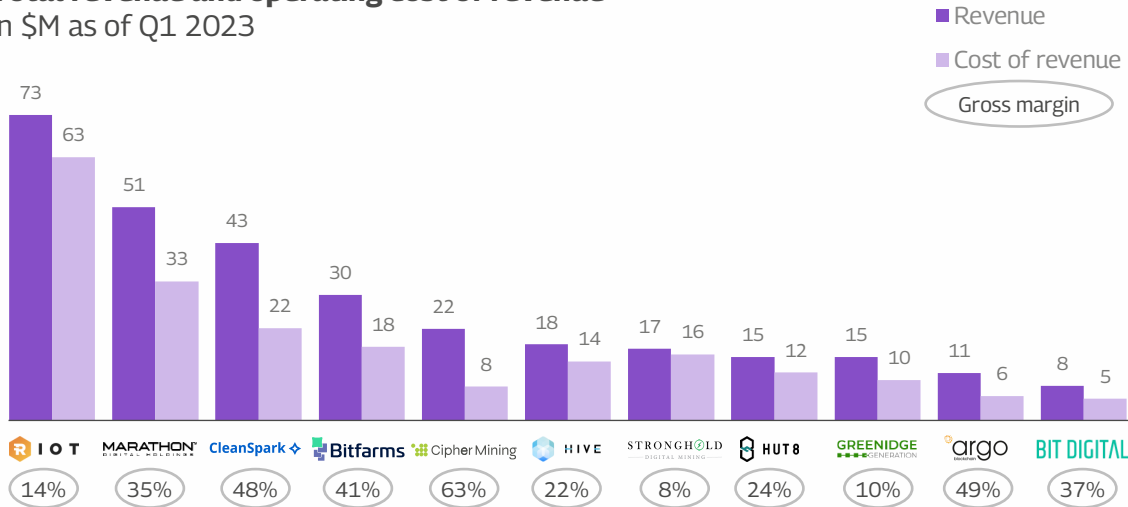
Overview

Miners, sorted alphabetically	BIT DIGITAL	Bitfarms	Cipher Mining	CleanSpark ↗	GREENIDGE GENERATION	HIVE	HUT8	argo blockchain	MARATHON DIGITAL ENERGY	R IOT	STRONGHOLD DIGITAL MINING
Revenue (\$M)	\$ 8.3M	\$ 30.1M	\$ 21.9M	\$ 42.6M	\$ 15.2M	\$ 18.2M	\$ 15.2M	\$ 11.4M	\$ 51.1M	\$ 73.2M	\$ 17.3M
Cost of revenue* (\$M)	\$ 5.2M	\$ 17.7M	\$ 8.1 M	\$ 22.1M	\$ 9.7M	\$ 14.2M	\$ 11.5M	\$ 5.8M	\$ 33.4M	\$ 63.1M	\$ 15.9M
Mining (%)	100%	100%	100%	100%	43%	100%	79%	100%	100%	51%	34%
Gross profit margin (%)	37%	41%	63%	48%	36%	22%	24%	49%	35%	14%	8%
Debt-to-Equity (%)	6%	22%	23%	12%	254%	32%	15 %	1705%	139%	14%	111%
Current ratio (%)	2,794%	170%	110%	80%	102%	377%	985%	99%	1,622%	326%	77%
Cost per BTC* (\$k)	\$ 14.3k	\$ 13.6k	\$ 6.5k	\$ 11.8k	\$ 10.6k	\$ 17.9k	\$ - **	\$ 11.8k	\$ 17.6k	\$ 10.4k	\$ 16.8k

During Q1, the companies below had a combined revenue of \$304M and generated a cumulated \$98M gross profit*

Profitability

Total revenue and operating cost of revenue
in \$M as of Q1 2023



Insights & key takeaways

Hut 8, Riot, and Stronghold have additional revenue streams other than self-mining. These sources include hosting, engineering services, high-performance computing and power sale.

This quarter every companies' revenues exceeded the cost of those revenues (excluding depreciation and administrative costs).

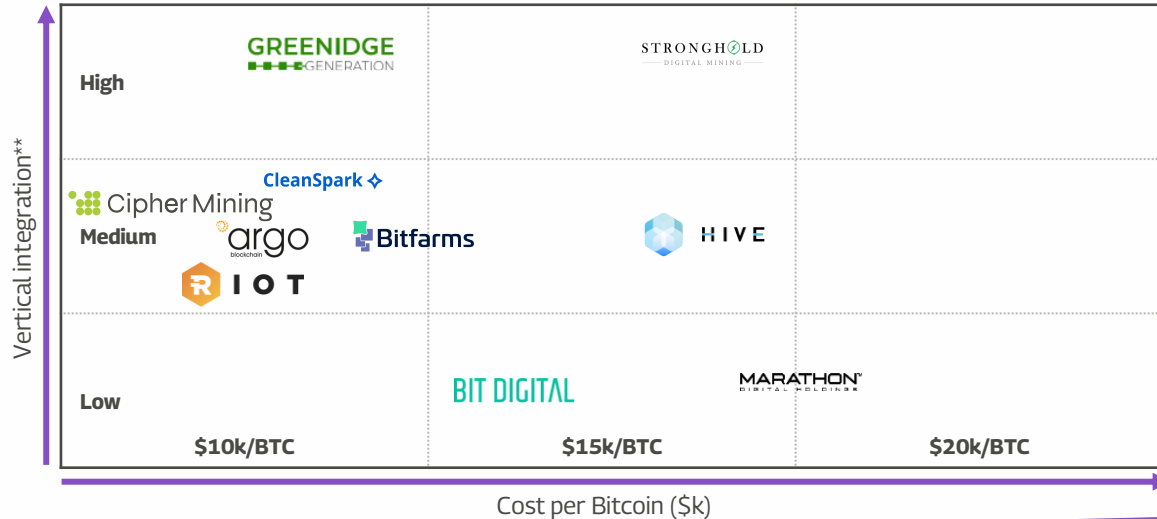
Marathon managed to grow their revenues by over 80% while keeping the costs similar compared to previous quarter.

Currently, there is no correlation observed between owning power generation assets and significantly lower cost per Bitcoin mined

Cost per Bitcoin

Vertical integration and cost per Bitcoin (based on cost of revenue*)

Overview as of Q1 2023



Insights & key takeaways

Marathon has the highest cost per Bitcoin mined. They have the lowest hash rate per USD equal to 3.2 EH/\$

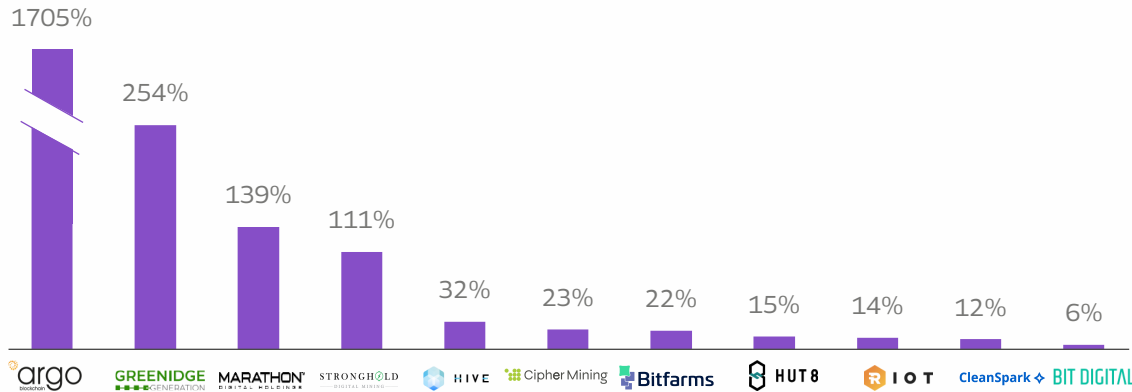
Stronghold is the only company in this comparison that completely relies only on proprietary power.

The average production cost per Bitcoin for companies is \$12k*. Estimation of Hut 8 cost per BTC is emitted, as Q1 BTC mining revenue costs are blended with HPC costs, therefore cost per BTC is not accurate

While Bitcoin mining companies were highly leveraged during the last bull run, they seem to have decreased their debt levels

Debt-to-Equity

Debt-to-Equity ratio
in % as of Q1 2023



Insights & key takeaways

Seven out of eleven companies have managed to achieve secure debt-to-equity ratios of about 50% or below.

With 1,705%, Argo Blockchain has the highest debt-to-equity ratio. A similarly high ratio was observed in Core Scientific before its announcement of bankruptcy.

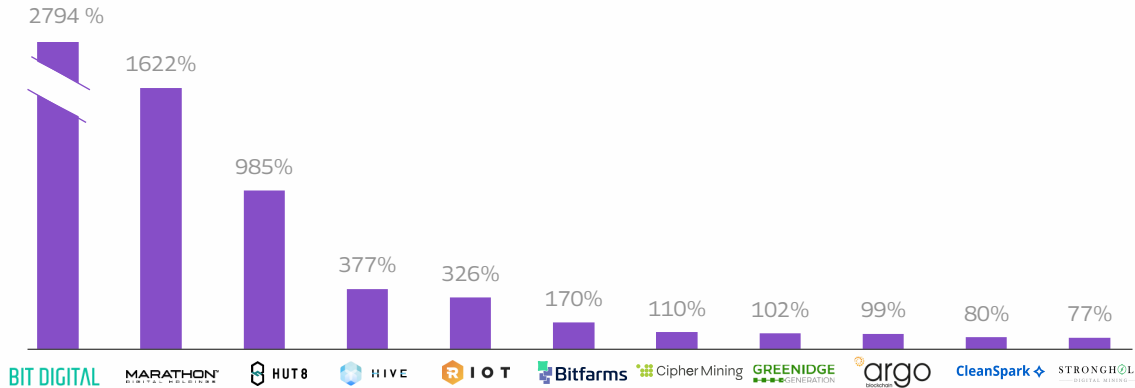
While the average debt-to-equity ratio was steadily increasing from 32% in Dec 21 to 82% in Sep 22, the ratio now decreased to 29% (excl. Argo Blockchain).

Most mining companies seem to be able to pay off their short-term debt

Current ratio

Current ratio

in % as of Q1 2023



Insights & key takeaways

A low current ratio of below 100% can be an indicator of severe liquidity risk. This is the case for Stronghold and Cleanspark.

Nine out of eleven companies seem to be able to easily deal with their short-term debt.

An extremely high current ratio, as with Bit Digital, Marathon and Hut 8, can be an indication of conservative capital allocation.

STRATEGIC COMPARISON

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This section gives detailed overviews about each company's business model, sites and KPIs.

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Company Overview and Business Model

- Argo is a Bitcoin mining company based in the UK with operations in Canada and the USA.
- The company relies on renewable sources of energy, such as hydro, wind, and solar, to power their operations.
- Argo faced liquidity issues which led them to sell their data center, and now they rely on being hosted

Headquarter & Datacenter Locations



Headquarter
London, Greater London (United Kingdom)

Data Center Locations

Current Planned



2
Quebec, CA



1
Texas, US

Financial and Operational KPIs

2.5 EH/s

Current Hash rate (June 23)

33.3 GH/USD

Hash rate per USD (June 23)

44

BTC on Balance Sheet (June 23)

2.8 EH/s

Hash rate Goal for 2023

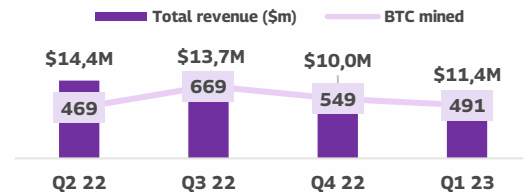
100%

Share of Revenue - Mining (Q1 23)

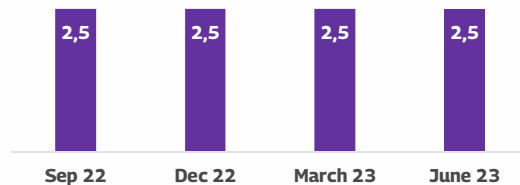
\$11.8k

Cost of Revenue per BTC (Q1 23)

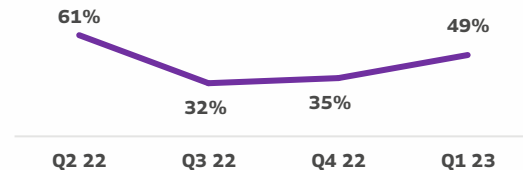
Revenue & BTC Mined



Bitcoin Hash rate (EH/s)



Gross Margin



BIT DIGITAL

Company Overview and Business Model

- Bit Digital is a US-American Bitcoin mining company with operations in four states, Canada, and Iceland.
- The company has recently started participating in the Proof-of-Stake (PoS) consensus for the Ethereum blockchain.
- All of Bit Digital's operations are hosted with other companies.

Headquarter & Datacenter Locations



Headquarter
New York City, New York (USA)

Data Center Locations



1
Texas, US



1
Nebraska, US



1
New York, US



1
Georgia, US



1
Canada



1
Iceland

Financial and Operational KPIs

1.8 EH/s

Current Hash rate (June 23)

5.4 GH/USD

Hash rate per USD (June 23)

485

BTC on Balance Sheet (June 23)

2.6 EH/s

Hash rate Goal for 2023

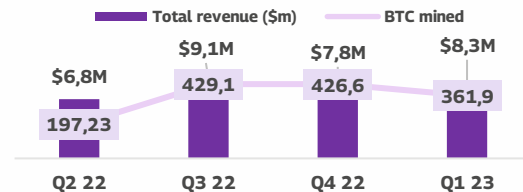
100%

Share of Revenue - Mining (Q1 22)

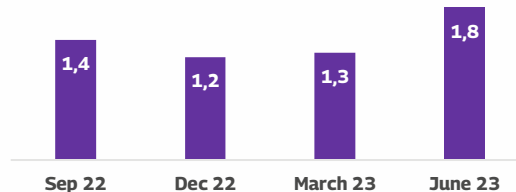
\$14.3k

Cost of Revenue per BTC (Q1 23)

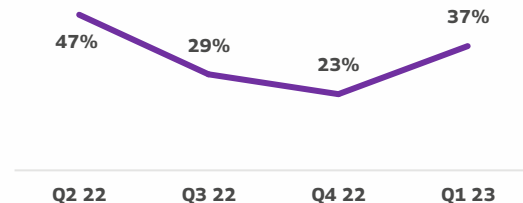
Revenue & BTC Mined



Bitcoin Hash rate (EH/s)



Gross Margin



Bitfarms

Company Overview and Business Model

- Bitfarms Ltd. is a Canadian Bitcoin mining company with data centers in North and South America.
- Most of their sites use hydroelectric power plants for their electricity generation. Bitfarms' Argentinian plant is powered by natural gas.
- A large share of their Bitcoin holdings is used as collateral for loans.

Headquarter & Datacenter Locations



Headquarter
Toronto, Ontario (Canada)

Data Center Locations

Current Planned



7
Quebec, CA



1
Washington, US



1
Paraguay



1
Argentina

Financial and Operational KPIs

5.3 EH/s

Current Hash rate (June 23)

12.4 GH/USD

Hash rate per USD (June 23)

549

BTC on Balance Sheet (June 23)

6.0 EH/s

Hash rate Goal for 2023

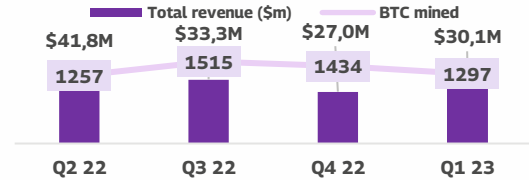
97%

Share of Revenue - Mining (Q1 23)

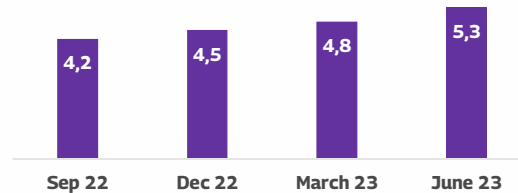
\$13.6k

Cost of Revenue per BTC (Q1 23)

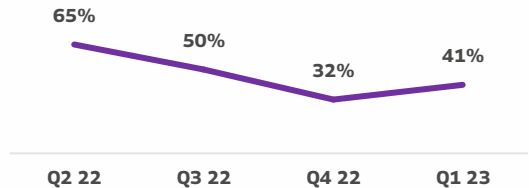
Revenue & BTC Mined



Bitcoin Hash rate (EH/s)



Gross Margin



Cipher Mining

Company Overview and Business Model

- Cipher Mining Inc., with 3/4 data centers operated through partnerships, began its own mining operations in Nov 2022 and is rapidly expanding.
- Its growth strategy includes building of new data centers, entering joint ventures and hosting deals.
- Operational and capital costs are covered by using the company's BTC holdings.

Headquarter & Datacenter Locations



Headquarter
New York, New York (USA)

Data Center Locations

Current Planned



4
Texas, US

Financial and Operational KPIs

6.7 EH/s

Current Hash rate (June 23)

7.1 GH/USD

Hash rate per USD (June 23)

417

BTC on Balance Sheet (June 23)

8.2 EH/s

Hash rate Goal for 2023

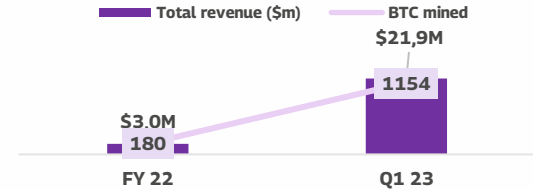
100%

Share of Revenue - Mining (Q1 23)

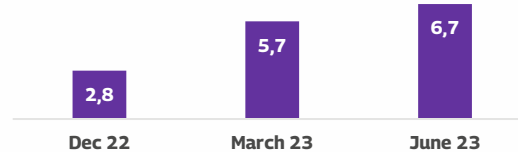
\$6.5k

Cost of Revenue per BTC (Q1 23)

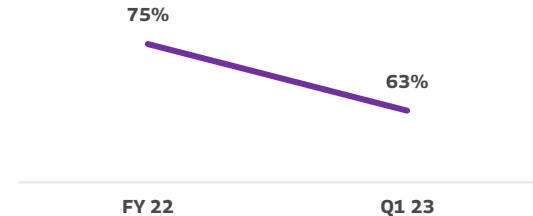
Revenue & BTC Mined



Bitcoin Hash rate (EH/s)



Gross Margin



CleanSpark ✨

Company Overview and Business Model

- CleanSpark is a US-American Bitcoin mining company with operations in Georgia and New York.
- This quarter, the company was the third-largest Bitcoin mining company in terms of Bitcoin mined (after Core Scientific and Marathon).
- They rely on a mix of owning data centers and hosting their miners with other companies.

Headquarter & Datacenter Locations



Headquarter
Henderson, Nevada (USA)

Data Center Locations

Current Planned



7
Georgia, US



1
New York, US



1
Texas, US

Financial and Operational KPIs

6.7 EH/s

Current Hash rate (June 23)

9.3 GH/USD

Hash rate per USD (June 23)

529

BTC on Balance Sheet (June 23)

16.0 EH/s

Hash rate Goal for 2023

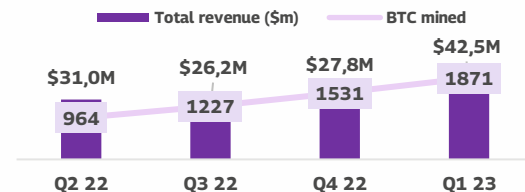
100%

Share of Revenue - Mining (Q1 23)

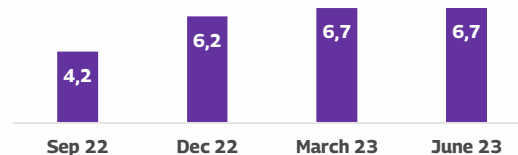
\$11.8k

Cost of Revenue per BTC (Q1 23)

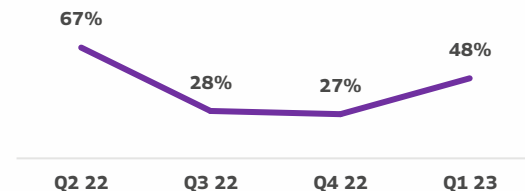
Revenue & BTC Mined



Bitcoin Hash rate (EH/s)



Gross Margin





Q4 earnings not available

Company Overview and Business Model

- Core Scientific is the second largest Bitcoin mining company in terms of hash rate.
- The company owns and operates data centers in various US-American states. These data centers are also used to offer hosting services.
- Core Scientific went bankrupt in December 2022 and got delisted from the NASDAQ.

Headquarter & Datacenter Locations

Headquarter
Austin, Texas (USA)

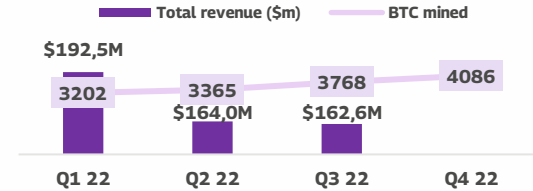
Data Center Locations

2 N. Carolina, US	2 Georgia, US	Current	1 Texas, US	Planned
1 Kentucky, US	1 N. Dakota, US	1 Oklahoma, US		

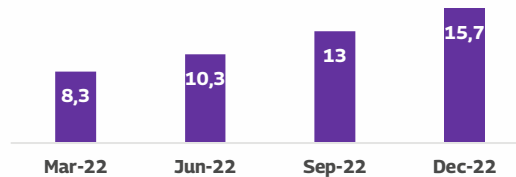
Financial and Operational KPIs

- 15 EH/s**
Current Hash rate (June 23)
- Hash rate Goal for 2023
- 47.5 GH/USD**
Hash rate per USD (June 23)
- Share of Revenue - Mining (Q4 22)
- 0**
BTC on Balance Sheet (June 23)
- Cost of Revenue per BTC (Q4 22)

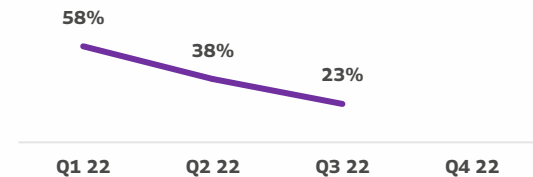
Revenue & BTC Mined



Bitcoin Hash rate (EH/s)



Gross Margin



GREENIDGE

GENERATION

Company Overview and Business Model

- Greenidge is a US-American Bitcoin mining and power generation company.
- They own and operate a gas power plant in New York, which they partially use to power their mining operation. The remaining power is sold to the grid.
- Greenidge always sells most of their mined Bitcoin.

Headquarter & Datacenter Locations



Headquarter
Fairfield, Connecticut (USA)

Data Center Locations

Current Planned



1
New York, US



1
South Carolina, US

Financial and Operational KPIs

2.5 EH/s

Current Hash rate (June 23)

59.5 GH/USD

Hash rate per USD (June 23)

0

BTC on Balance Sheet (June 23)

3.6 EH/s

Hash rate Goal for 2023

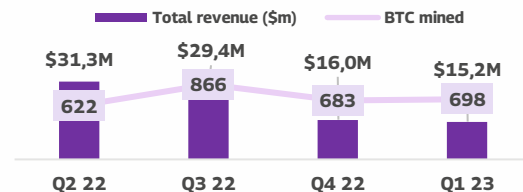
43%

Share of Revenue - Mining (Q1 23)

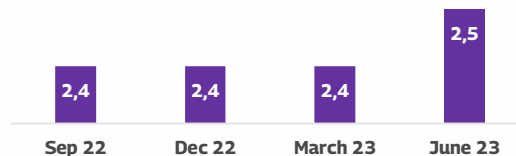
\$10.6k

Cost of Revenue per BTC (Q1 23)

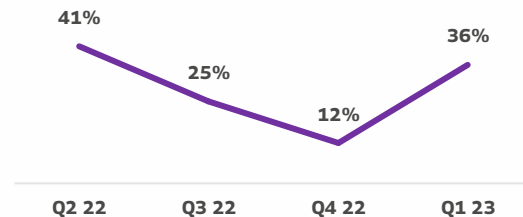
Revenue & BTC Mined



Bitcoin Hash rate (EH/s)



Gross Margin





Company Overview and Business Model

- Hive is a Canadian Bitcoin mining company with operations in Canada, Sweden and Iceland.
- They rely entirely on renewable sources of energy, such as hydro power (Sweden, Canada) and geothermal power (Iceland).
- Like most other Bitcoin mining companies, Hive had to deviate from their 'HODL' strategy.

Headquarter & Datacenter Locations



Headquarter
Vancouver, British Columbia (Canada)

Data Center Locations

Current Planned



3
Sweden



2
Iceland



1
Quebec, CA



1
New Brunswick, CA

Financial and Operational KPIs

3.3 EH/s

Current Hash rate (June 23)

7.3 GH/s

Hash rate per USD (June 23)

1,967

BTC on Balance Sheet (June 23)

6 EH/s

Hash rate Goal for 2023

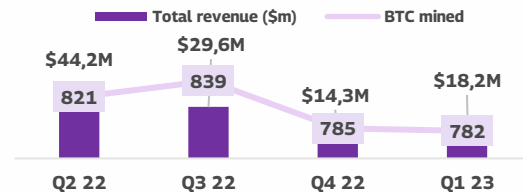
100%

Share of Revenue - Mining (Q1 23)

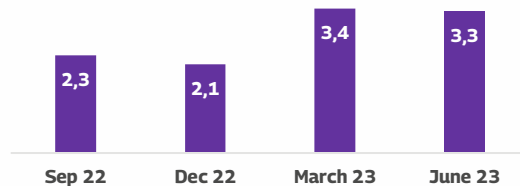
\$17.9k

Cost of Revenue per BTC (Q1 23)

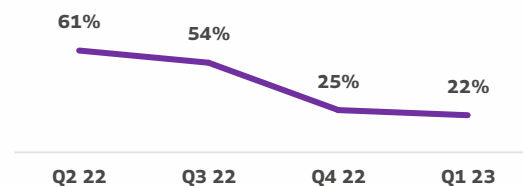
Revenue & BTC Mined



Bitcoin Hash rate (EH/s)



Gross Margin





Company Overview and Business Model

- Hut 8 is a Canadian Bitcoin mining and high-performance computing (HPC) company.
- They are among the top 10 largest institutional Bitcoin holders and place second among publicly listed Bitcoin mining companies.
- The company currently relies on a "mix of renewable energy" and plans to be carbon-neutral by 2025.

Headquarter & Datacenter Locations



Headquarter
Toronto, Ontario (Canada)

Data Center Locations

Current Planned



2
Alberta, CA



1
Ontario, CA

Financial and Operational KPIs

2.6 EH/s

Current Hash rate (June 23)

3.2 GH/USD

Hash rate per USD (June 23)

9,136

BTC on Balance Sheet (June 23)

3.6 EH/s

Hash rate Goal for 2023

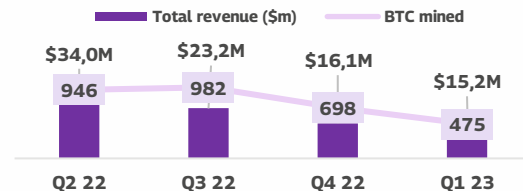
76%

Share of Revenue - Mining (Q1 23)

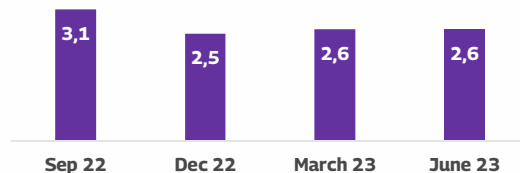
-*

Cost of Revenue per BTC (Q1 23)

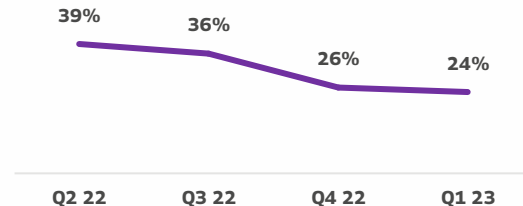
Revenue & BTC Mined



Bitcoin Hash rate (EH/s)



Gross Margin



MARATHON™

DIGITAL HOLDINGS

Company Overview and Business Model

- Marathon is the largest (in terms of hash rate) US Bitcoin mining company with planned operations in three different states.
- Marathon does not own any infrastructure but does only host their miners.
- Marathon is by far the largest Bitcoin holder among publicly listed mining companies.

Headquarter & Datacenter Locations



Headquarter
Las Vegas, Nevada (USA)

Data Center Locations

Current Planned



2 + 1
Texas, US



2
North Dakota, US



1
Abu Dhabi, UAE

Financial and Operational KPIs

17.7 EH/s

Current Hash rate (June 23)

6.2 GH/USD

Hash rate per USD (June 23)

12,538

BTC on Balance Sheet (June 23)

23 EH/s

Hash rate Goal for 2023

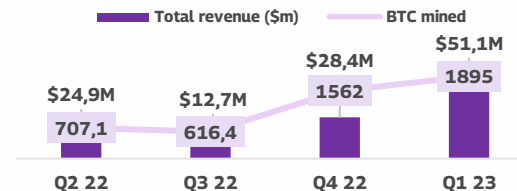
100%

Share of Revenue - Mining (Q1 23)

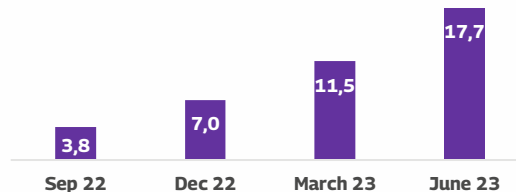
\$17.6k

Cost of Revenue per BTC (Q1 23)

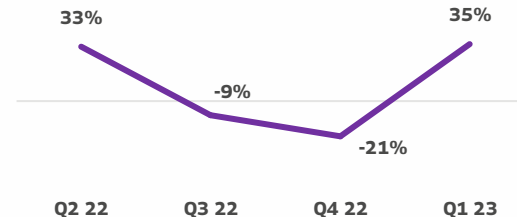
Revenue & BTC Mined



Bitcoin Hash rate (EH/s)



Gross Margin





Company Overview and Business Model

- Riot is a Bitcoin mining, hosting and engineering company, with mining operations in central Texas.
- With an additional 4.1 EH/s, Riot had the largest nominal increase in hash rate during Q4 2022.
- Their facility in Texas represents the largest Bitcoin mining facility in North America.

Headquarter & Datacenter Locations



Headquarter
Castle Rock, Colorado (USA)

Data Center Locations



1 + 1
Texas, US

Current Planned

Financial and Operational KPIs

10.7 EH/s

Current Hash rate (June 23)

3.3 GH/USD

Hash rate per USD (June 23)

7,250

BTC on Balance Sheet (April 23)

12.5 EH/s

Hash rate Goal for Q2 2023

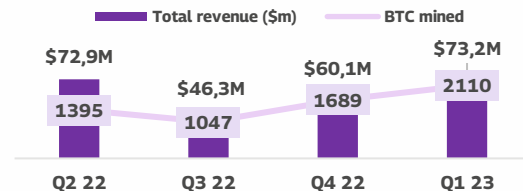
66%

Share of Revenue - Mining (Q1 23)

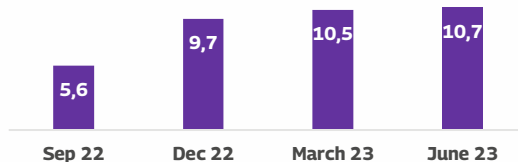
\$10.3k

Cost of Revenue per BTC (Q1 23)

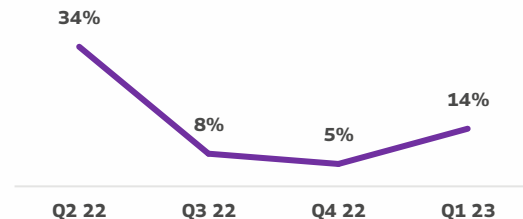
Revenue & BTC Mined



Bitcoin Hash rate (EH/s)



Gross Margin



STRONGHOLD

DIGITAL MINING

Company Overview and Business Model

- Stronghold is a US Bitcoin mining, hosting and power generation company with two sites in Pennsylvania.
- The company generates power through the reclamation of coal refuse sites, a method classified by Pennsylvania as a Tier II alternative energy source.
- They operate on a "mine-and-sell" strategy. As of Q1'23 has the highest Hash Rate per USD.

Headquarter & Datacenter Locations



Headquarter
New York City, New York (USA)

Data Center Locations

Current Planned



2
Pennsylvania, US

Financial and Operational KPIs

4 EH/s

Current Hash rate (June 23)

92 GH/USD

Hash rate per USD (June 23)

39

BTC on Balance Sheet (June 23)

4 EH/s

Hash rate Goal for 2023

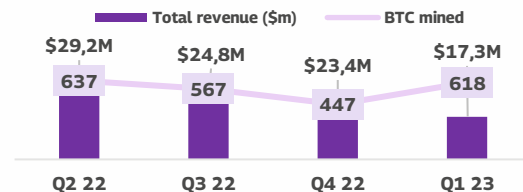
65%

Share of Revenue - Mining (Q1 23)

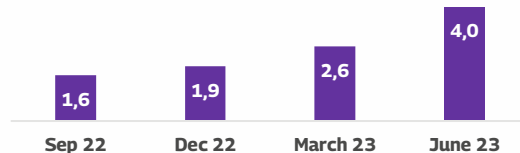
\$16.8k

Cost of Revenue per BTC (Q1 23)*

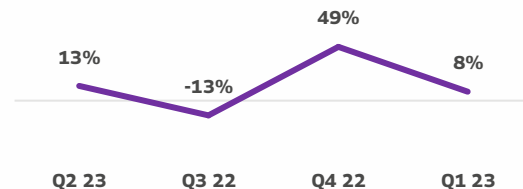
Revenue & BTC Mined



Bitcoin Hash rate (EH/s)



Gross Margin



STRATEGIC COMPARISON

OPERATIONAL COMPARISON

FINANCIAL COMPARISON

COMPANY OVERVIEWS

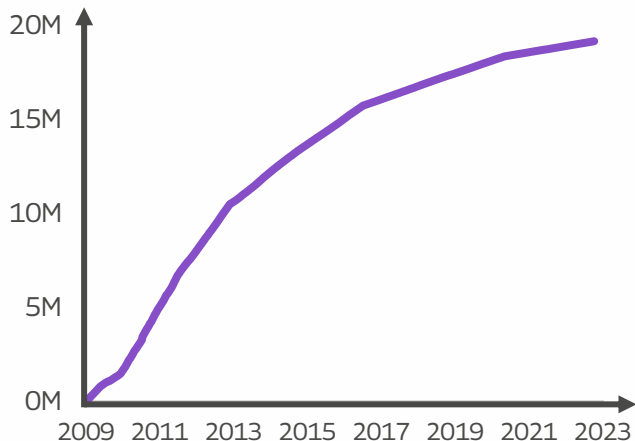
APPENDIX

This section gives additional general information about Bitcoin, hash rate development and Bitcoin mining.

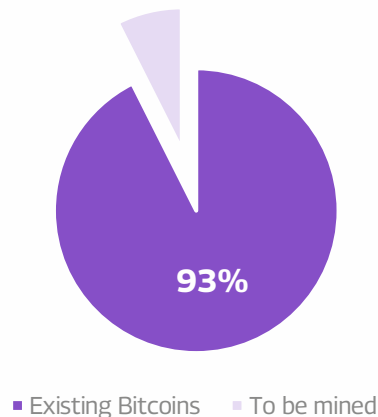
Almost 93% of total Bitcoin supply has already been mined. Mining the remaining 7% will take approximately 120 years.

Bitcoin Supply

Bitcoin Supply
in million BTC



Bitcoin Mined Supply
in % as of June 2023



key takeaways

Currently, there are approximately 194M BTC in existence, meaning that 1.6M are left to be mined.

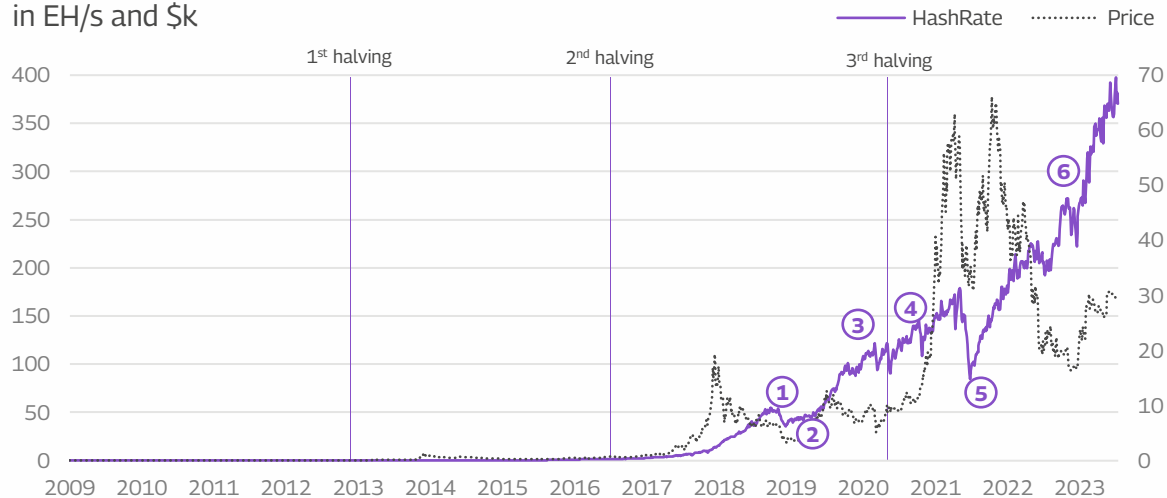
Every day, around 144 new blocks are added. This implies that around 900 new BTC are mined daily, with a block reward of 6.25 BTC per block.

Considering that a halving occurs every 210k blocks, it is estimated that the last Bitcoin will be mined in the year 2140.

The historic hash rate development can be categorized into six major phases and events.

Bitcoin hash rate

Hash rate and Bitcoin price development in EH/s and \$k



- 1 First BTC hype through industrial miners
- 2 Drop due to China's seasonal effect
- 3 Second BTC hype through new generation miners
- 4 Significant market uncertainties
- 5 Drop due to China's BTC ban
- 6 Increase fueled by hype brought by further institutional adoption

There are several factors which affect a miners' profitability. Most of the revenue factors can't be controlled by the miner.

Mining profitability

Revenue

$$\left[\left(\frac{\text{Miner hash rate}}{\text{Network hash rate}} \right) * (\text{BTC price}) * (\text{block reward}) * (\text{blocks}) \right]$$

Miner hash rate

Performance with which a miner can mine blocks on the blockchain

Network hash rate*

Overall network performance to mine blocks on the blockchain

BTC price*

Price in FIAT money at which BTC can be exchanged

Block rewards*

Rewards in BTC that miners get for mining a transaction

Blocks*

Estimate of how many blocks are mined in a given period

*Not in control of the miner

Cost

$$[(\text{Price of miners}) + (\text{Cost of electricity}) + (\text{Other related expenses})]$$

Price of miners

Price of the hardware required to mine blocks on the blockchain

Cost of electricity

Price of the electricity used to run the mining hardware

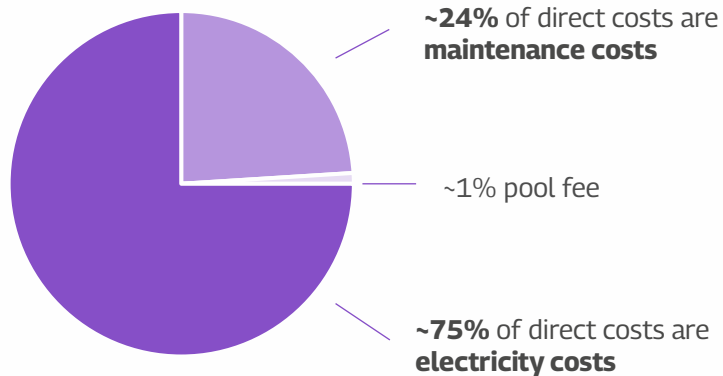
Other related expenses

This includes other expenses associated with mining cryptocurrencies, like protecting hardware from overheating, housing the hardware, etc.

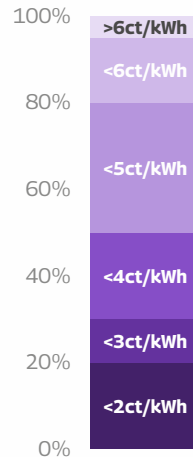
Cost of electricity is the main OpEx driver and substantially determines the profitability of a mining company.

Electricity cost

Mining OpEx Indicative



Electricity price among miners worldwide in \$c/kWh, as of 16.09.2021



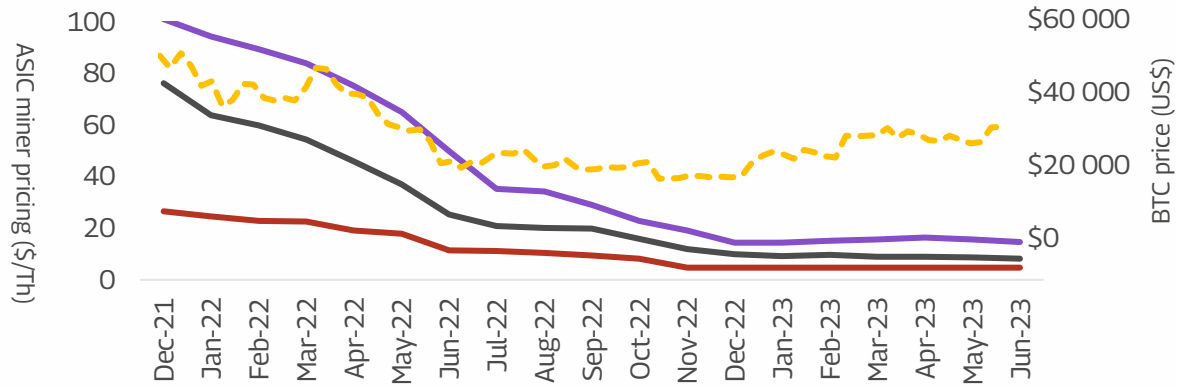
Electricity Costs Determine Profitability

A good mining site
has electricity costs
of \$4c or less.

ASIC miner prices followed the price of Bitcoin in the past. Their prices decreased massively since their peak in Nov/Dec 2021.

Mining hardware cost

ASIC miner pricing vs. BTC price
in \$/Th and US\$ as of June 2023



Key takeaways

Over the last 12 months, ASIC miner prices fell by about 85%, in line with the price decline of Bitcoin.

The relative premium in the price of high-efficiency miners vs. low-efficiency miners (~3.1x), high-efficiency miners vs. average-efficiency miners (~1.8x) and average-efficiency miners vs. low-efficiency miners (~1.7x) stayed at about the same level.

"Bear markets" can be a good opportunity to buy new ASIC miners for future operations.



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