

BitOoda

The Weekly Hash, 11/30/21

Year-end Hashrate Likely To Be ~180 EH/s

Bitcoin gained 2.7% week-on-week (WoW) to \$57,920 as of midnight UTC on 11/29. Sunday's difficulty adjustment saw a decrease of 1.49%, equivalent to a target Hashrate of 159.8 EH/s. The ProShares BITO ETF trails BTC by 2.2% since fund inception; the fund launch correlates strongly with increased CME open interest, as AUM increased rapidly in the first week from launch.

Contango on the CME has remained mostly flat vs. a week ago, and current open interest fell 8.1% WoW to 13,201 lots. The Commitment of Traders data from 11/23 shows a large increase in non-reportable shorts, roughly 3 times that of 11/16, while leveraged managers increased their long and decreased their short positions. The net length on the CME is now short 729 lots for non-commercial players (the YTD minimum), from short 357 lots the prior week.

Total BTC earnings per PH/s are ~5.70 mBTC, up from ~5.63 mBTC / PH/s last week on the recent reset increasing earnings slightly (1mBTC or milliBTC = 1/1000 BTC). Transaction fees dropped 17 bps WoW to 1.2% of miner rewards, or 0.08 BTC per block. The "Mempool" shows low congestion levels, with ~2,500 pending transactions. We continue to assess congestion will likely stay low for awhile with the falloff of trading activity in Asia, where a higher percentage of on-exchange transactions result in on-chain transactions.

Bitcoin mining revenue gained to \$330 / PH/s per day and \$360/MWh owing to the

decrease in difficulty. Miner economics are on track to come in modestly better than our previous year-end estimate, as it is unlikely that we will see ~30 EH/s come online in the next month. The current block rate suggests that the actual year-end Hashrate will fall short of our prior 198EH/s forecast, and will likely be closer to 180EH/s.

The BitOoda North American Hash Spread™ rose 3.8% from \$295 to \$307 as spot gains outweighed the power price increase.

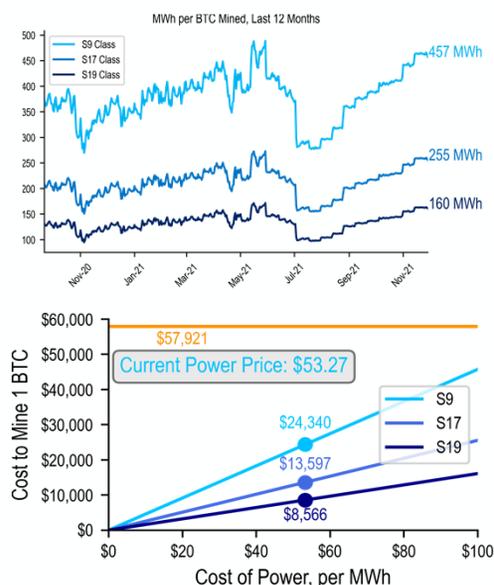
We define the BitOoda Hash Spread™ as the difference between the cost of power per MWh and the Bitcoin mining revenue per MWh. This gives miners a quick sense of the surplus generated by their business to cover personnel, overhead, depreciation, and profit. The weighted average around the clock U.S. wholesale industrial power price (5 markets) of \$53.27 / MWh leads to an aggregate spread of \$307.

Older-gen S9-class devices saw their Hash Spread™ up ~3% to \$73/MWh. S17-class devices, the bulk of the installed base, saw a hash spread of about \$174/ MWh.

	S9 Class	S17 Class	S19 Class
Hash Spread	\$73	\$174	\$307
Week on Week	2.7%	3.5%	3.8%

It now takes 160 MWh to mine 1 BTC using S19-class rigs, while S17-class machines would consume 255 MWh, and S9-class, 457 MWh. This translates into \$8,566 in power expense to mine 1 BTC with S19 class rigs, and \$24,340 using S9 rigs, a ~58%

contribution margin, excluding labor.



Takeaways

- Despite a declining Bitcoin price over the last two weeks, mining presents very attractive margins with a likely 10% downside to our prior 198EH/s YE Hashrate estimate
- The financial ecosystem connecting Bitcoin to traditional markets continues to evolve, with the Bitcoin Futures ETF driving CME volumes and open interest
- Net length worsened to short 729 lots, a YTD low, while leveraged traders appear to be shifting slightly long and non-reportable shorts increased by 300%

Research

Sam Doctor^{ac}
 Chief Strategy Officer | Head of Research
 sam@bitooda.io
 @CryptoSamDoctor | @Sam_Doc

Mark Chin | mchin@bitooda.io

BTC Price (11/30 at 10am EDT) **\$58,113**

Obs Hashrate **165 EH/s**

Key Takeaways

- Despite a declining Bitcoin price over the last two weeks, mining presents very attractive margins with a likely 10% downside to our prior 198EH/s YE Hashrate estimate
- The financial ecosystem connecting Bitcoin to traditional markets continues to evolve, with the Bitcoin Futures ETF driving CME volumes and open interest
- Net length worsened to short 729 lots, a YTD low, while leveraged traders appear to be shifting slightly long and non-reportable shorts increased by 300%
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BitOoda 2021 Hash Estimates

~198 EH/s by Year End Would Be a Stretch

- On September 16, we estimated a ~198EH/s year end (YE) 2021 target Hashrate
- Since then, target Hashrate continues to recover, although it is slightly lower than we had expected at this point and fell 1.5% at the last reset to 159.8 EH/s
- It would take an 11% difficulty increase over the two remaining resets this year to match our estimate
- This appears to be a stretch, given the continuing power infrastructure bottlenecks and the current pace of ASIC miner deliveries
- **Thus, miner profitability may modestly exceed our expectations over the next few months**

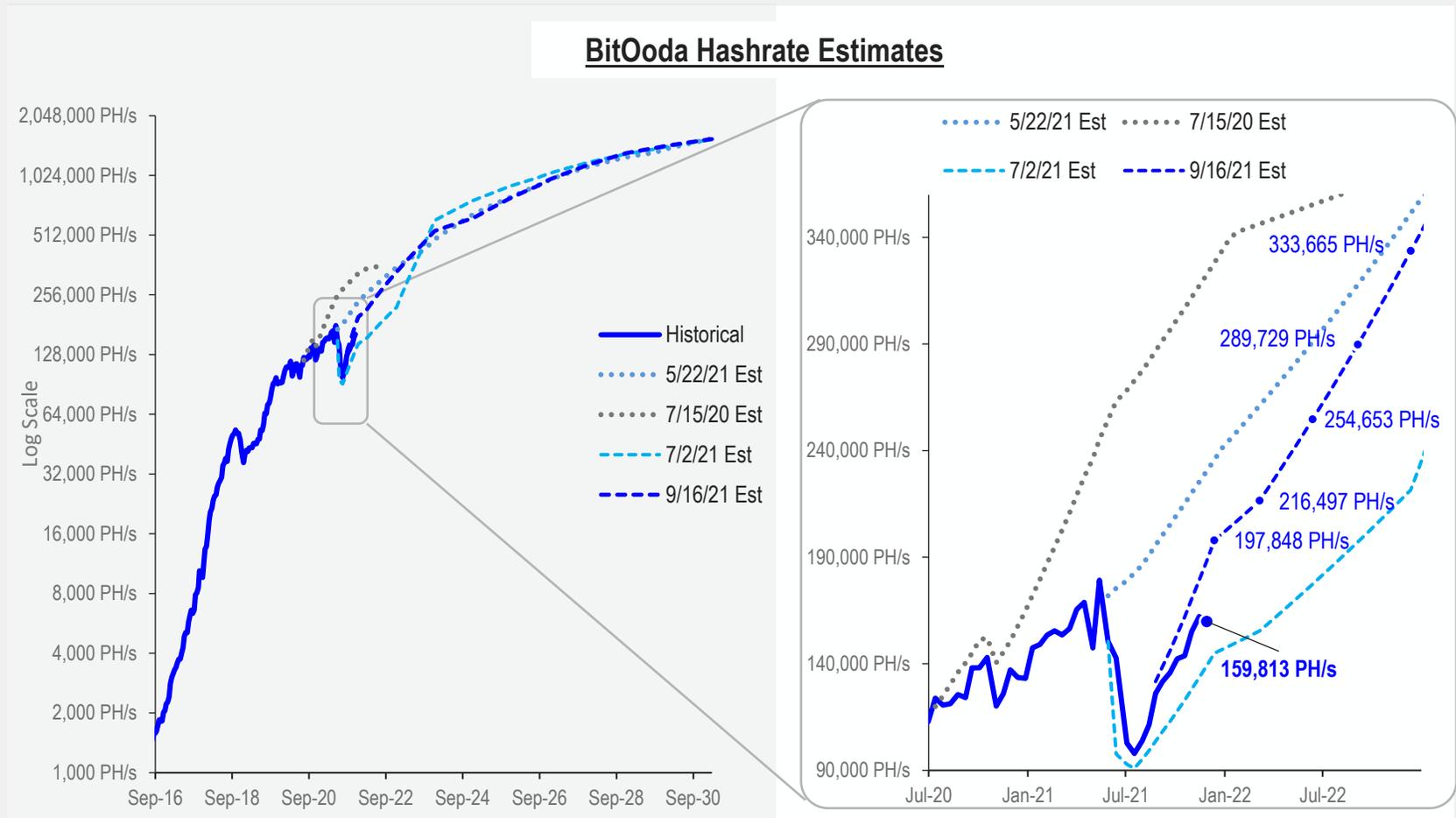


Figure: Historical and Estimated Target Hashrate 2017-2030
 Historical as of 11/28/21; Estimates as of 9/16/21, 7/2/21, 5/22/21, and 7/15/20

Source: BitOoda estimates, CoinMetrics

Low Contango Open Interest Dips

- The contango remains mostly flat to up slightly vs. a week ago, though May dipped into backwardation on 0 open interest
- CME open interest decreased 4.1% vs. two weeks ago and 8.1% vs. last week to 13,201 lots
- Open interest for December expanded significantly to 10,232 lots, up from 8,064 lots last Tuesday. Last week, Dec OI was month+1; the 4,256 active contract OI lots expired / were rolled over last week

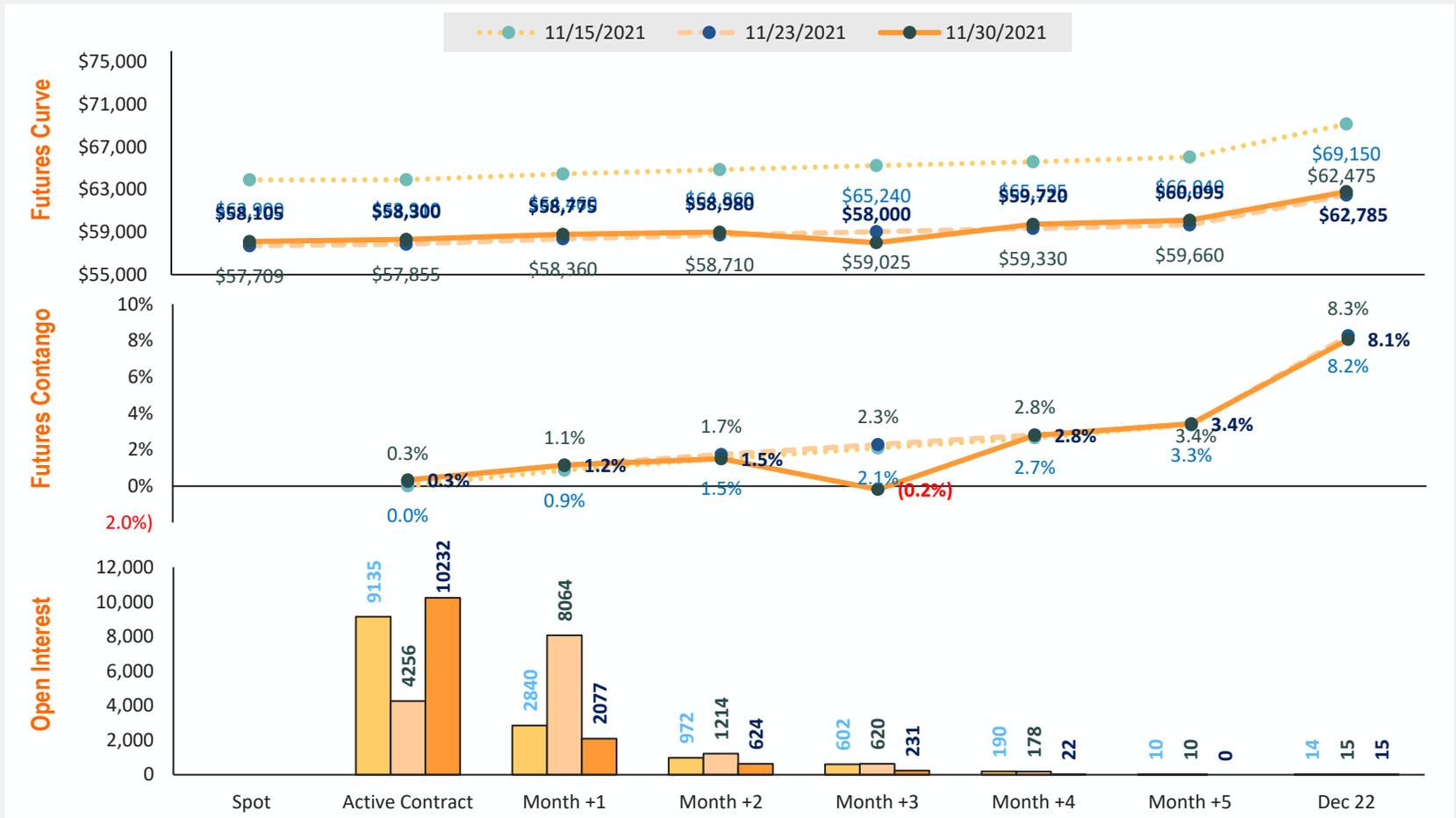


Figure: Bitcoin futures metrics

Source: CME, Bloomberg

CME YTD Open Interest Picking Back Up After ETF Peak

- CME Bitcoin Futures open interest increased significantly ahead of the launch of the Bitcoin Futures ETFs
- While it dropped after the October futures expiry, OI is climbing once again
- OI is climbing following the 11/28 November expiry and low trading volumes with the Thanksgiving weekend

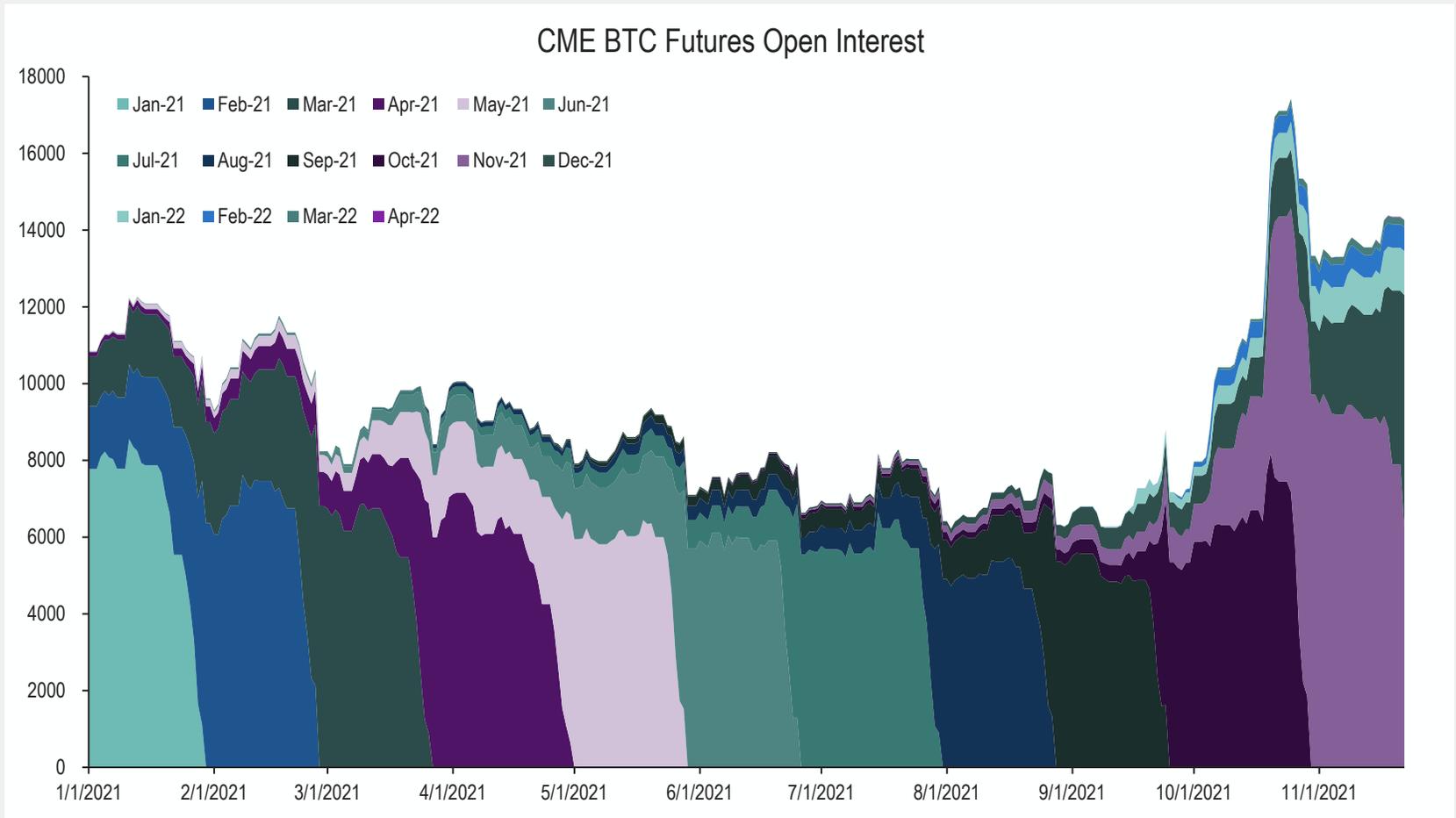


Figure: CME BTC Futures Open Interest history

Source: Bloomberg



ProShares Futures ETF BITO

Slightly Below BTC, Price Tracking NAV

- The ProShares ETF BITO currently has a market cap of \$1.4 billion
- The ETF has underperformed Bitcoin by 2.2%, declining by 11.6% since launch vs. an 9.4% decline in the price of BTC in the same timeframe
- Price very closely tracks the underlying NAV; the two series are almost indistinguishable from each other

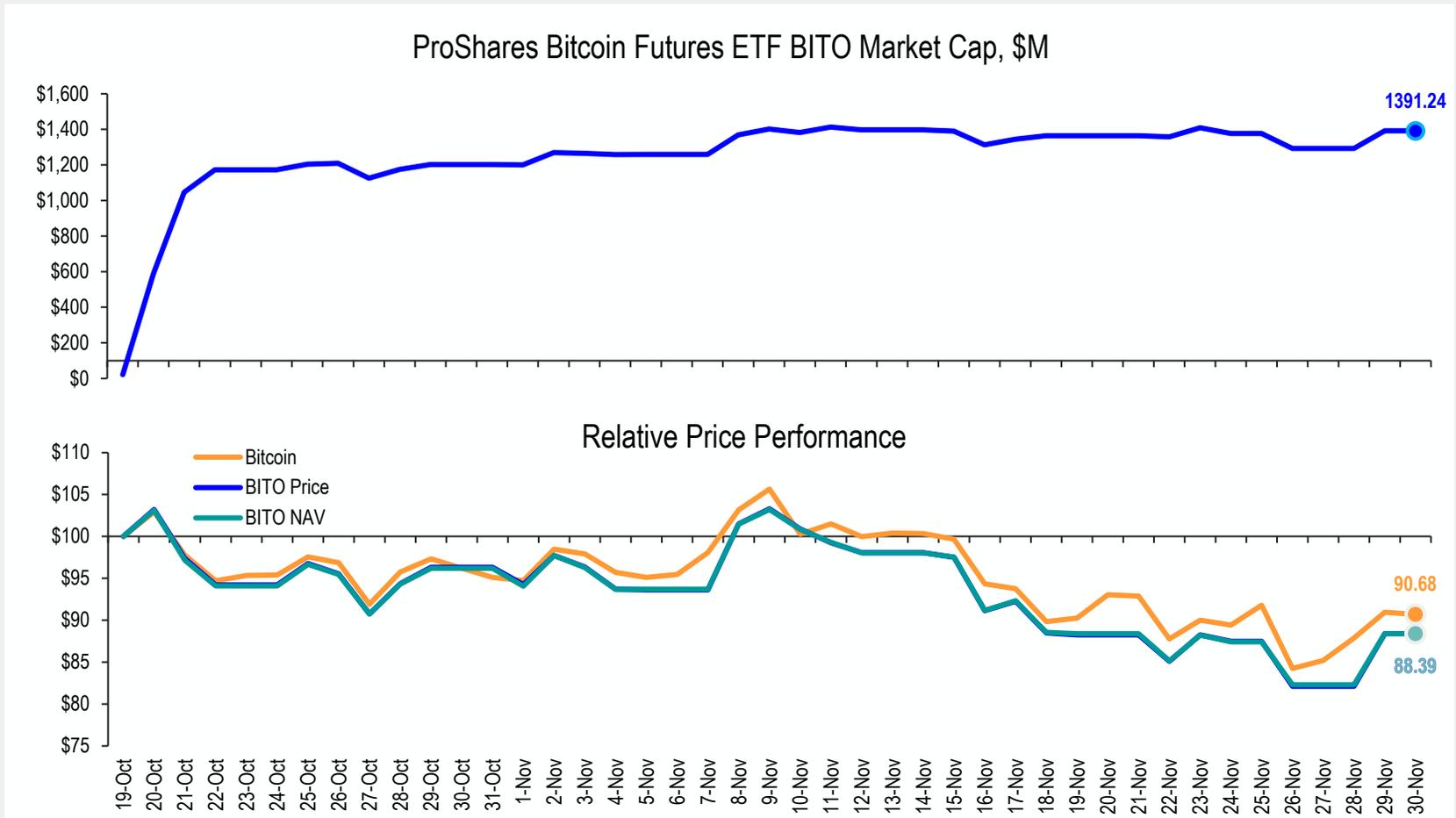


Figure: ProShares Bitcoin Strategy Futures ETF market cap and price performance compared to Bitcoin

Source: Bloomberg

CME Commitment of Traders 11/23 Open Interest Climbed

- The CME Bitcoin Commitment of Traders report shows that open interest increased ahead of the Thanksgiving holiday and option expiry
- Data shows 14,353 lots on 11/23 last week, compared with 13,605 on 11/16/21
- Spreading positions decreased, while asset managers increased their net long positions
- Leveraged players reduced their net short positions, offsetting an increased net short by non-reportables
- Commercial players increased their net long
- CoT data is released with a lag, showing positions as of the preceding Tuesday, compared with open interest on the preceding slide, which is a more real-time indicator

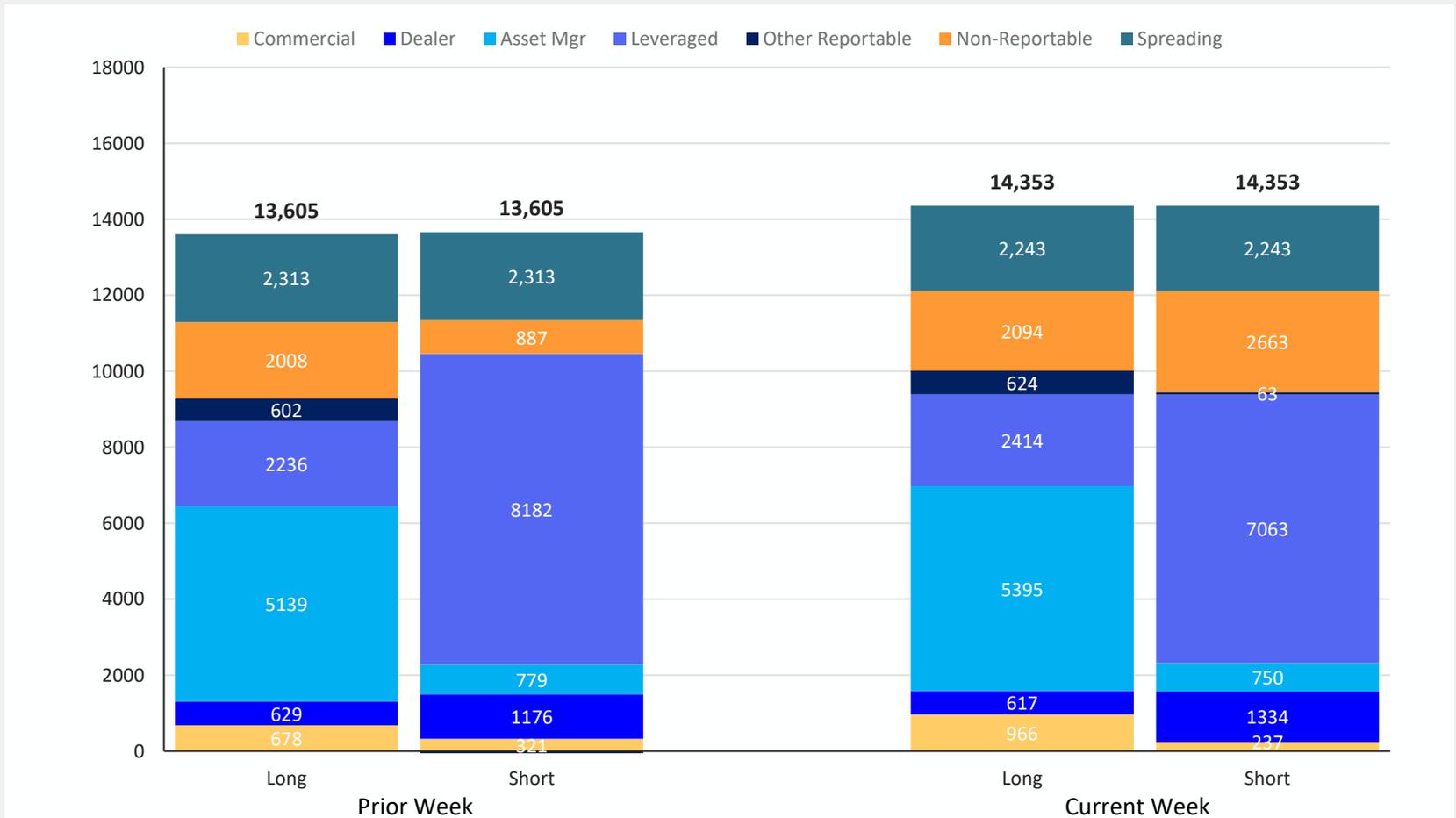


Figure: CME Bitcoin Commitment of Traders, 11/23/21 and 11/16/21

Source: Bloomberg

Non-Commercial Net Length Short 729 Lots

- Commercial Bitcoin players are not very active in the options space, participating mainly in the futures arena
- Commercial positioning has been largely long futures
- As a result, the net position for non-commercial market participants has been largely short
- The net length for non-commercial participants is now short 729 lots, the low for the year



Figure: CME Bitcoin Future Non-Commercial Net Length, YTD

Source: Bloomberg



BitOoda Hash™ Dashboard

November 30, 2021

Definitions

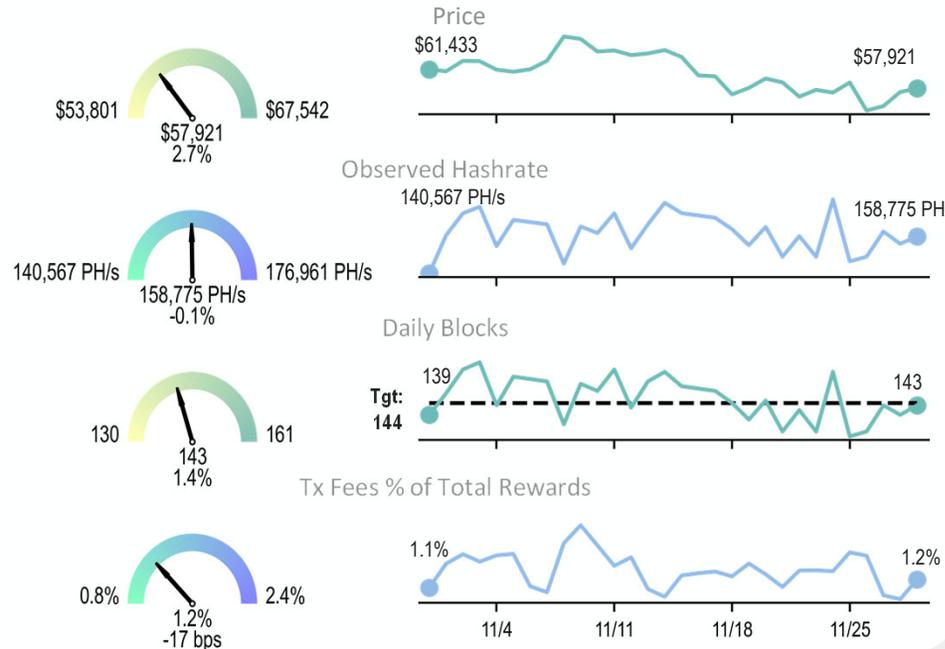
Hash Spread: the difference between the revenue per MWh from mining BTC and the weighted average cost of peak and off-peak power across 8 US zones. It is a quick measure of the profitability of US-based latest-generation mining rigs.

MWh: Megawatt hour

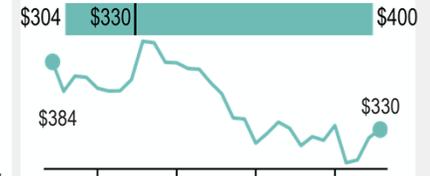
PH/s: Petahash per second

Tx Fees: Fees for BTC transactions

30 Day Range and 7-day % change



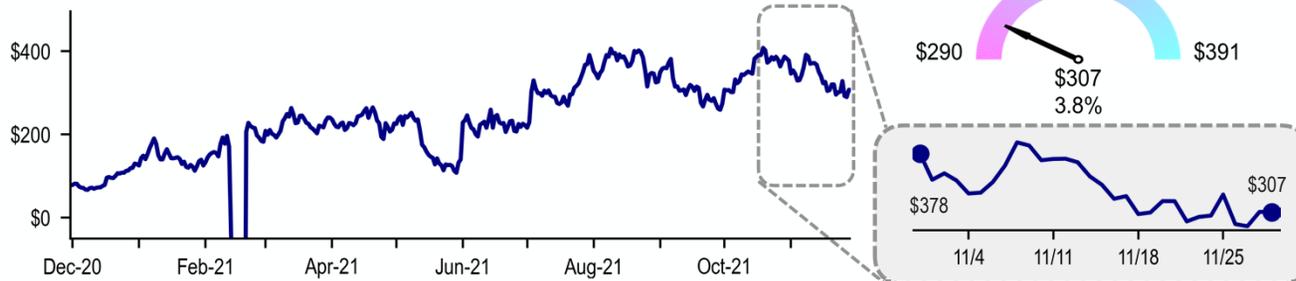
Daily Revenue per PH/s



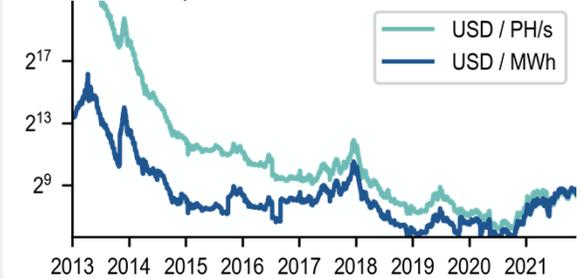
Revenue per MWh (\$19 Class)



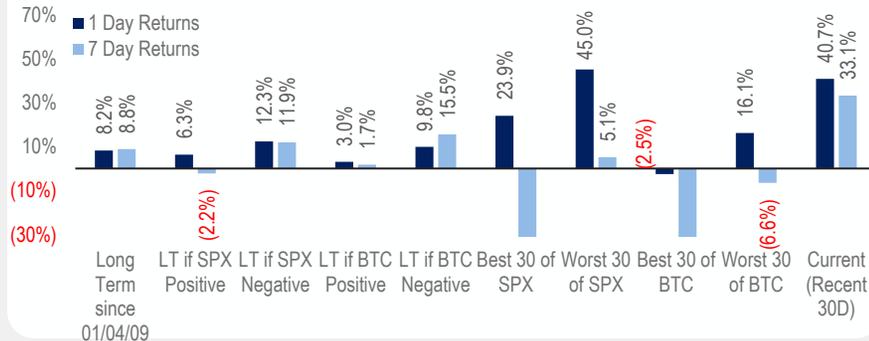
BitOoda North American Hash Spread™



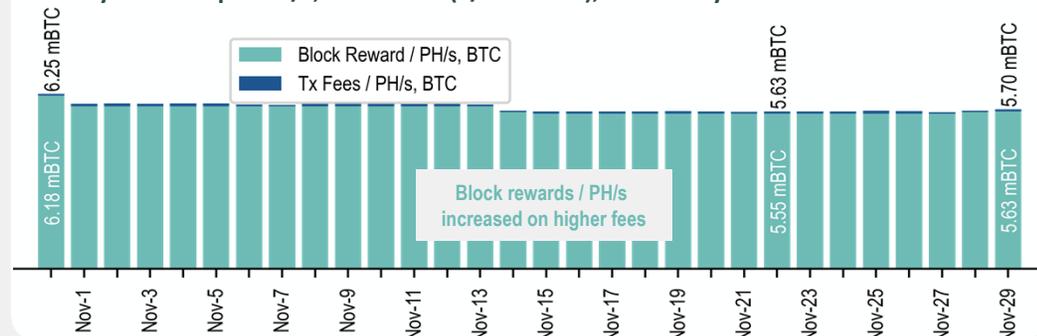
Revenue, since 2013



Historical BTC Correlation to S&P500



Daily Rewards per PH/s, in milliBTC (1/1000 BTC), last 30 days





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