

*diffusetap*  
Virtual Event Series

# What Happened to Bitcoin Mining?

*Guest Speaker:*



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Head of Derivatives  
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*Hosts:*



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## DiffuseTap: What Happened to Bitcoin Mining?

Last time on DiffuseTap, Matt Williams, Head of Derivatives at Luxor, talked to us about the profitability of Bitcoin mining in 2023, the problem with most failing Bitcoin mining businesses, and how the space is incentivizing and promoting innovation in the energy sector.

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### DiffuseTap

This networking session is part of our weekly virtual events series. Networking (you'll bump into at least a dozen high caliber fund managers) meets purposeful (you'll tap into brand-new sources of ideas)... straight from your armchair like a boss.

### Meet the Speaker



MATT WILLIAMS is a technology innovation professional with almost two decades of experience leading strategic initiatives in capital market structure, data science, corporate strategy, and corporate venture capital. He is currently the Head of Derivatives at Luxor, a US-based company that is building traditional markets and derivatives to support Proof of Work crypto mining operations.

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**KENNY ESTES:** Let's hear from Mr. Matt Williams. Matt, would you mind telling the good folks a little bit about your background and what you're up to over at Luxor?

**MATT WILLIAMS:** First of all, thank you for having me. Glad to be number 160, it's my favorite number. A quick background on myself. I come from traditional finance. I started off my career as a clerk on the Board of Trade floor a million years ago. I progressed into a trading career. I was an oil and gas trader on the New York Mercantile Exchange. After New York, I moved back to Chicago, where I currently reside, to trade Agricultural commodities.

I had a short stint at a software company that built options trading software for market makers called OptionsCity, and then went to work for the Chicago Mercantile Exchange. During my time at the CME Group, I was part of the digital asset team on corporate strategy. We were the ones that launched Bitcoin futures back in 2017. We had a bunch of other exposure to the digital asset space as well.

We had early stage investments in Ripple and DCC, and a number of blockchain companies as well. And then, during my last couple years that I was there, I was on the corporate venture capital side of things which invested in fintech, digital assets, AI, and ML. And then, I spent two years at a regulator, at the National Futures Association, before joining Luxor technology. That's where I'm at right now.

I am the head of derivatives at Luxor, a Bitcoin mining infrastructure company. We have all sorts of verticals to support Bitcoin miners, including our mining pool, which is one of the largest in North America and in the world. We also do firmware. We help people procure ASICs. We offer ordinals as well on an ordinal marketplace. We built a hash rate marketplace, an OTC market that we launched in January of this year. I'm hoping to talk a bit about all of that today.

**AYLA KREMB:** Awesome. Well, we'll dig into some of the background around Bitcoin mining because it has been all the rage for the past three years, since 2019 or 2020. What has happened in that space? Is it still profitable? We saw a lot of companies listed in the hopes of taking over the world. What's the state of Bitcoin mining at the moment?

**MATT:** We're starting with the heavy questions right off the bat. It's a yes or no question, to be honest. There are a bunch of variables that go into answering whether or not mining is still profitable. Obviously for some it is, for some it isn't. There are a lot of lessons that the space has learned in the last 18 months. But just to give a bit of history before I fully answer the question, historically speaking, miners have struggled under a high cost of capital. And that remains true today.

When you compare Bitcoin mining to other similar industries like oil and gas, or even precious metals, miners have a significantly higher cost of both equity and debt than more mature commodity industries. Miners have barriers that are more challenging than more mature commodity industries, combined with the fact that debt investors are highly reluctant to invest in the mining space today.



That was not necessarily the case a couple of years ago, but it's definitely the case now. Miners that are looking to grow, if they can get hold of any debt at all, they usually get an ASIC-back loan. For those not familiar, ASICs are the hardware that drives mining. You can use those as collateral. But it still comes at a very high interest rate, somewhere between 10 and 15%, and sometimes higher. When you compare that to a gold producer, they can get equipment-back loans that are around 7%. That is significantly less.

When you look at that high cost of capital, there are two main negative effects that relate to Bitcoin mining companies. The first is that the high cost of capital prevents them from reaching their growth potential. This is especially prohibitive to small and mid-tier miners, because they don't have the robust production going, and they can't use the Bitcoin to fund further growth. And then, the second problem is that if you are able to secure that debt, the high interest rate payments eat up a huge portion of their net income. When you think about whether miners are profitable, that's one component of it.

There are several components that go into it, but the reason the cost of capital is so high for mining is because there is an elevated cash flow uncertainty. That is caused by fluctuations in what is called hashprice. Hashprice is actually very relevant to what I do. You can think of hash price as the expected value of your hash rate, and we think of that in terms of petahash.

Right now, given the run we just had in Bitcoin, the hashprice will be somewhere in the \$70 range. But this price is extremely volatile, and it changes with the Bitcoin price. It changes with the number of people that are mining and the mining difficulty. It changes with transaction fees on the blockchain, and it changes with the block rewards.

And so, when you take all that into consideration, you have these extreme fluctuations in hashprice, which equates to extreme fluctuations in revenue. And historically, there haven't been any ways to hedge that revenue. It's a HODL culture. People typically want to mine, and then they want to hold on to their Bitcoin and see it go to the moon, as they say. But if you're not hedged, and you weren't hedged over the last 18 months, you saw your revenue decrease significantly. And in some cases, you became insolvent.

That's a long winded way of answering the question of whether mining is profitable. The answer is, well, it is if you can manage your treasury appropriately. It is if you can manage your power cost appropriately. And it is if you can hedge out your revenue risk. However, I think all three of those have not been done. I would say the risk management skills of the mining space have been iffy at best for the last couple of years.

But as I said, people are learning that lesson. We're seeing a big growth in this space in terms of maturity. The smart people that we're talking to are building robust hedging strategies across all their different risk exposures. And so, I would say that if you want to talk about the factors that work against miner profitability, one of them is this concept of network hash rate which I mentioned.

If you're not familiar, the more people that are mining, the harder it is for a miner to mine, and the less rewards they can anticipate getting. That's called difficulty. And right now, we're seeing an increasing amount of network hash rate growing, which means there are more and more miners coming online, which makes it less profitable for existing miners.



The second piece is this concept of having a schedule. Every four years, the rewards that you get from Bitcoin are cut in half. We have one coming up in 2024, roughly around April. So, that is another thing working against miner profitability, because the rewards are going to be cut in half overnight. And the last piece contributing to mining not being profitable is this aversion to hedging. It's a HODL culture, as I mentioned. They have a lack of hedging experience, and they have this perception that hedging is expensive.

However, it's not all bad. To round out the question, there are things that make it profitable for miners right now. Hardware is super cheap. New generation ASICs are around \$21/TH. Compared to around this time last year, that is almost three times cheaper. If you're starting out or you're trying to redo your inventory, now is a great time. You can buy stuff for super cheap, relatively speaking.

There is also an increase in cheap energy via renewables. People that are looking to lower their costs of operation have more access now than they used to. And lastly, there is an increasing amount of hedging instruments. There are lots of instruments hedging your power costs. There's a growing amount of instruments for hedging your treasury. And obviously, what we do is offer instruments to hedge your mining revenue risk.

**KENNY:** Let's talk about the energy risks a little bit, because you mentioned it a couple of times there. A lot of people talk about the price of energy in kilowatts or gigawatts, or however they denominate it. How much of that is commoditized? There's a bottom, and almost everybody understands where that is. How impactful is that on the profitability of the overall operation? Obviously, with a high hash price and Bitcoin being at 60,000, it's probably more important now. How does that interplay work, and how can you hedge that?

**MATT:** It's massively important. We had a long period of fairly stable energy prices in the last three years. And so, it wasn't really top of mind for people to hedge that out. You could have variable power costs, and it wasn't a huge impact, especially since you had very high margins for the mining space.

Fast forward to now, when you have much lower margins for the mining space and you have widely variable power costs, it's hugely important. When you talk about your power costs, for example, in terms of kilowatt hours, there is a price point where it becomes completely unprofitable, depending on the types of machines that you have. It's super important.

There are a number of different ways that you can hedge that out. I think the most common that you see is like a PPA, which is a Power Purchase Agreement, where you can lock in your power costs for a given amount of time. The space is very mature when it comes to derivatives and other ways to hedge. You have PPAs, you have offtake agreements, and you also have a number of OTC products that are usually specific to your region or node, which is great.



In addition, you also have Exchange-traded derivatives. You have a number of exchanges that have electricity contracts. Even going further, you could hedge with crude oil or nat gas on CME. You can hedge on ICE. You have a wealth of opportunity to hedge with derivatives such as futures and options on oil, gas, etc. You also have swaps and futures options, which are growing super fast.

I would say that in the energy space, it is super important. Especially now, going into the halving that I mentioned. If you do not have access to cheap power and your revenue is effectively going to be cut in half at a given point, you could be in very serious trouble.

**AYLA:** Fascinating. There are some questions here in the chat. One of them is, can we create a hash rate for a futures contract?

**MATT:** Well, we've had a lot of success with the OTC markets. I think that was the place we wanted to start. There's absolutely no reason why you could not create a futures contract. I think there is some buzz around this as well. There are a number of ways you could do it, just like you would with Bitcoin futures. It comes down to, would you rather do a physically-delivered future, or cash-settled future?

To me, the answer is emphatically, yes, you can do it. But you also need the right exchange partner. It's very complicated when it comes to creating the contract specs for something like this, at least if you're doing it the way that I would do it. That's because we focus on hash price, which is the expected value of hash rate. But when you unpack what hash price is, there are four main components that go into it.

You have the network hash rate, or the difficulty that I mentioned. You have transaction fees, which are super relevant today given the recent spikes we've seen with the introduction of ordinals. Third, you have the block reward as well. And then, you have the Bitcoin price. You have four components that are variables within that, so you have to be very cognizant of how that works.

And lastly, it's very similar to an electricity contract, where it's a contract hash rate and is a continuously producing commodity that produces Bitcoin. You have to factor that in. It's not like you just have a barrel of oil or a bushel of corn, that you actually have this steady stream of Bitcoin very similar to electricity. You have to factor in a floating price when you do a futures contract. That's a long winded way of saying, yes, we should do it, but there are a lot of concerns to think about prior.

**KENNY:** I have a high level question. Bitcoin is proof of work. It's mining. That's what everybody talks about when they talk about mining. But that's not the only proof of work network out there. Ethereum famously moved from proof of work to proof of stake. Someone asked you this knowing your bias, but do you see that as the future? Do you see proof of work networks taking on less and less of the market over time, and a lot of this mining-type play dissipating? How do you see that playing out?



**MATT:** I think you're already seeing that happen. You saw that happen over the last two years. There aren't a lot of proof of work instruments out there anymore. However, I am a huge believer in proof of work over proof of stake. They both have their merits and disadvantages, but we're focused on proof of work. We're focused on Bitcoin, and we certainly believe in the power of the proof of work network.

Honestly, I think you will see less and less of everything. When it comes to tokens and cryptocurrency, there is too much garbage that exists. I think you will ultimately see Bitcoin coming out on top, and there will be ETH and just a handful of others. But obviously, I can't tell. To me, proof of work is just a much more proven way of doing things. Proof of stake, like I said, has its merits. I don't want to disparage that. It's a loaded question.

**AYLA:** Let's take another couple of minutes to talk about this space. Where do you think the new revenue is going to come from? And also, is there going to be some level of innovation in this space, or is it going to be more of a consolidation after people have figured out how to hedge properly? What do you think this is going to look like over the next six to 12 months?

**MATT:** I think innovation will probably come from energy consumption. I think that's one of the great things about proof of work and Bitcoin in general. You see more and more progress in renewables, because, as a miner, you're incentivized to have cheap energy. I think that if you want to innovate in terms of energy consumption, you have to be financially motivated.

Unfortunately, it doesn't come through policy. I mean it can, but I think financially motivated innovation is better. In the Bitcoin space, if you want to be profitable, if you want to have higher margins, and if you want to have lower energy, the way to do that is through renewables like hydro wind, solar, and nuclear. That's where that innovation is going to come in.

But when you talk about the space in general and who's going to survive, or if there is a consolidation, you have to look at four main things. You look at who can produce the most, where the production comes from, who is the best in cost efficiency considering the power type and the hardware, what are their growth prospects, and do they have access to capital and a good balance sheet.

What we're seeing now is diversification as well. Are mining firms getting into hosting more? Are they getting into blockchain development? Are they getting into AI? Are they broadening their regional exposure and removing some of that regional risk? Etc.

You can look at that across some of the existing public companies. The top producers are Riot, Core, Marathon, and more. You look at Hive Blockchain and they're focusing on green energy sources like hydro. Bitfarms is recognized as one of the most efficient mining companies as well.

The PubCos are looking to mine more Bitcoin with less power, exploring different firmware, power supply units, cooling methods, and ways of innovating. To answer your question, I think the ones that have survived are the ones that are going to address those four main components.



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