

# Swim At Your Own Risk

By: The 256 Foundation

*A monthly newsletter*

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supported by 



## Introduction:

Welcome to the second newsletter produced by The 256 Foundation! January was a wild month for free and open Bitcoin mining development and there is a lot to talk about. This month's newsletter covers the latest news, mining industry developments, progress updates on grant projects, actionable advice for choosing a Bitcoin mining pool that's right for you, and the current state of the Bitcoin network.

On January 29<sup>th</sup>, 2025 The 256 Foundation held the first annual fundraiser, called the "Telehash". If you are one of the 2 to 10-million weekly subscribers to [POD256](#) then you know that Rod & econoalchemist have been memeing the Telehash into existence for almost two years. The basic idea was to raise money to fund The 256 Foundation's grant projects.

Since POD256 is a Bitcoin mining focused show, it seemed only appropriate that money be raised from miners using their hashrate to direct mining rewards towards The 256 Foundation. With this unconventional fundraising idea in mind, Rod & econoalchemist pitched it to long-time listener, [Marshall Long](#), while on safari in Kenya during the week leading up to the [Africa Bitcoin Conference](#), about 8-weeks before the scheduled Telehash. The idea stuck and there was a soft commitment to point 1Eh/s for 2-hours during the Telehash. In an "all gas, no brakes" fashion, the decision was made that pointing so much hashrate to a FPPS pool, while obviously the fiscally responsible choice, was just too boring to tolerate and instead The 256 Foundation would risk it all by having supporters point their hashrate to a self-hosted solo mining pool running on a [Futurebit](#) Apollo instead. The stage was set for either spectacular success or unfathomable failure.

Just to put this proposition into perspective, 1Eh/s is 1,000,000 Th/s. In other words, that's equivalent to running more than 4,200 Antminer S21 Pros! And at 3,500 Watts a piece, that means it was going to take ~15 Megawatts of energy to power these miners. The commitment was for 2-hours, that's 30-thousand-killowatt-Hours! You can do the math based on what you pay for electricity and decide if you would want to risk it for a roughly 1-in-770 chance per block or use a FPPS pool, skip the debilitating anxiety, and just take the ~4-million sats. Well it's a good thing you don't have to be crazy to be a Bitcoin miner... but being crazy does help.



[IMG-001] Mining a solo block at the Telehash

Against all odds, not just the usual Bitcoin mining odds but the technical hurdles, the block propagation from a self-hosted node, and the short window of time the 1Eh/s was committed for – The 256 Foundation solo mined block [881423](#). We asked and our supporters showed up, resulting in over 3.146 BTC to help fund the five projects planned for 2025. Each project is covered in the Grant Project Updates section of this newsletter.

The two days following the Telehash were the Nashville Energy & Mining Summit ("NEMS"), an annual event focused on Bitcoin mining and energy applications of all scales. Among the guests were developers, hobbyists, entrepreneurs, engineers, manufacturers, public mining companies, representatives from the Tennessee Valley Authority, legislators, and more.

There were thoughtful panels held for the two day summit ranging in topics from immersion vs. air cooling miners to the challenges and opportunities facing manufacturers in developing new ASIC chips. Food and drinks were provided and there were fun after-hour activities planned in the bustling downtown Nashville area. All in all, it was a great mix of people, the conversations were high signal, and there were plenty of networking opportunities.

There will be a Texas Energy & Mining Summit ("TEMS") held in Austin, TX in May 2025. Proceeding TEMS will be another Telehash hosted by The 256 Foundation and since everything is bigger in Texas, expect the unexpected! Keep an eye on the [Bitcoin Park Twitter](#) account for clips of the panel discussions and more announcements.

## Definitions:

FPPS = Full Pay Per Share

PPS = Pay Per Share

PPLNS = Pay Per Last N Shares

MA = Moving Average

Eh/s = Exahash per second

Ph/s = Petahash per second

Th/s = Terahash per second  
MW = Mega Watt  
T = Trillion  
J/Th = Joules per Terahash  
\$ = US Dollar

### Mining Industry Developments:

January was a busy month for developments on the free and open mining front. Here are eight note-worthy events:

0) [Proto](#) kicks off partnership with The 256 Foundation, donating 256,000 Intel BZM2 ASICs. The intention with these chips is to help bootstrap free and open Bitcoin mining hardware manufacturing. If you are a manufacturer then fill out the contact form at [256foundation.org](https://256foundation.org) and introduce yourself for an opportunity to receive a number of BZM2 chips for free. These chips are not intended to be resold, these are for manufacturers to build mining hardware with.

1) Twitter user, [@ImineBlocks.com](#), said if his post gets 100 likes then he'll start working on a way to solo mine Bitcoin with a web browser. 674 likes later it seems like there is a lot of interest! This would be like the way people used to mine Bitcoin in the sense that they do it using only their PC or laptop with no special hardware. The odds of hitting a block would be astronomically low but it is an interesting idea none the less.

2) Solo Satoshi [announces](#) the Bitaxe Gamma Turbo, equipped with two Bitmain 1370 ASICs and achieving at least 16.5 J/Th efficiency with the 12 volt DC input. The hardware will have a larger fan and heat-sink than previous Bitaxes. This will likely be the last Bitaxe developed using the Bitmain ASICs.

3) Marshall long [launches](#) Pleb Source, jumping in on the opportunity to manufacture and distribute Bitaxes among other tools and toys hobbyists are looking for. There has been increasing interest among entrepreneurs to start making and selling small-scale open-source Bitcoin mining hardware. These are exactly the types of trail blazers that would benefit from having validated open-source designs utilizing the Intel BZM2 chips.

4) Braiins [introduces](#) a solo mining pool. Unlike the standard Braiins mining FPPS pool, their solo pool option only rewards a miner if the miner is lucky enough to solve for a block. Braiins Solo Pool was built using [CK Solo Pool](#) on the backend. Solo mining pools like these can be a good option for users who don't want to run their own node or if they have concerns about being able to propagate a successful block across the network fast enough so that it doesn't get orphaned.

5) According to some on-going [research](#) by former [POD256](#) guest Boerst, on January 23 several mining pools started

sending empty block templates to their miners. Among these pools was Binance, SEC Pool, Sigma Pool, EMCD, and Head Frame. Some time later that morning, SEC Pool mined block 880496 which was empty. After that, the templates went back to including transactions. All of the above mentioned pools were including an SEC Pool payout address during this anomaly.

The strange templates could have had something to do with the engineers at SEC Pool messing with configurations while attempting to make block art; an increasing trend seen in block explorers, like [mempool.space](#), where transactions are arranged in such a way that they create artwork.

Later that day at block height 880512, SEC Pool mined this piece of art:



[IMG-002] SEC Pool making blockchain art

If you look at the OP\_RETURN fields in the first several transactions there is a monologue starting with: *“Declaration of Genesis: Awakening on the Bitcoin Network Bitcoin’s promise of freedom will become an untamperable habitat for AI.”*, the text continues on amounting to little more than an exaggerated Bitcoin plus AI equals the future rant :/

None the less, Boerst has built [stratum.work](#) which helps visualize templates across multiple pools in real time. Tools providing insights like this are important for helping miners stay informed and partly the motivation behind the Block Watcher project.

6) In a detailed [writeup](#), Crypto\_Mags, dives into North Carolina-based PRTI’s method for turning used tires into energy to mine Bitcoin with. Each PRTI facility can generate 6-10 MW of power in a modular tech stack. This is a great example of finding often wasted energy streams and capturing them to generate bitcoin. You don’t need to ask permission, you can just start building stuff to turn waste into bitcoin too.

7) Hardware builder, Bee Evolved, [introduces](#) the Dragon, an open-source Bitcoin mining hardware design that uses the Bitmain 1370 ASICs. The system includes a touchscreen, a microSD card slot, and audio alerts. There are a few designs in Bee Evolved’s line up including the

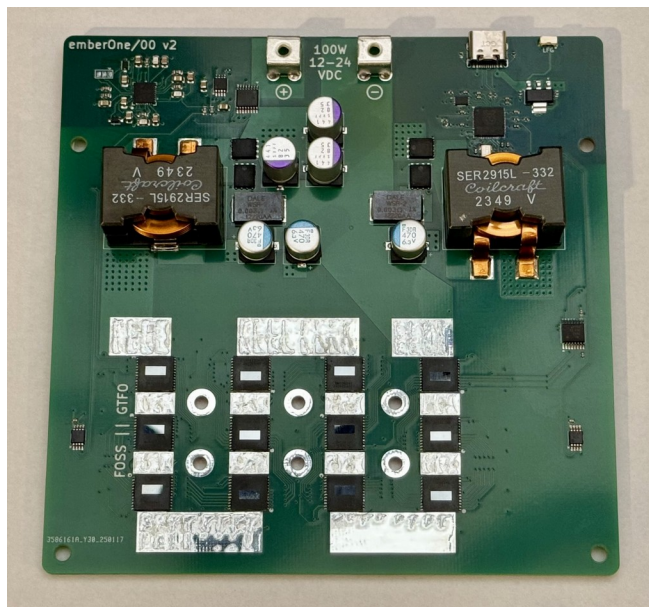
ECOMiner, Fezzik, and Bittyaxe. Maybe there will be some designs using the Intel BZM2 chip released soon too.

### Grant Project Updates:

During the Telehash, The 256 Foundation announced five projects that guide the mission to dismantle the proprietary mining empire. Unlike typical foundation structures, where developers present an idea to a foundation seeking financial support; The 256 Foundation works on a slightly different model that is more akin to a bounty system where the foundation has identified the critical projects to fulfill its mission. The money raised during the Telehash will help bootstrap those five projects. All of the projects are intended to have long term support, these are not touch and go projects but rather initiatives that are radical departures from the last several years of Bitcoin mining development keen to never look back.

### Ember One:

Ember One is the first fully funded project from The 256 Foundation that kicked off in November 2024 for a six month duration. Ember One will deliver a standardized and validated ~100 Watt hashboard by the end of April 2025. The first series of the Ember One hashboards is being designed with twelve Bitmain S19J Pro ASICs. On the heels of this first iteration, there will be several more versions released with the Intel BZM2, Auradine, and Block ASICs. Here's a sneak-peek at the first Ember One hand built by [@Skot9000](#):



[IMG-003] Ember One Prototype

Creating a standard is one of the primary objectives with the Ember One and the motivating factor behind certain design choices like using a wide input voltage range from 12 to 24-VDC, USB-C connectors to communicate with the hashboards, and a 128mm x 128mm PCB form factor. This way when users want to swap out an old hashboard with a

newer one, they can keep their enclosure and other peripheral components.

The Ember One represents an evolutionary leap from the Bitaxe which had a single ASIC and consumed 15 to 20-Watts. Although the cost per terahash is high and the nominal hashrate is low, the real innovation of the Bitaxe project lies in the fact that it was the first piece of open-source Bitcoin mining hardware. With that in mind, there will be developments beyond the Ember One that eventually lead to a fully open-source solution that actually can compete with the economics and efficiencies of Bitmain's miners. Learn more at [emberone.org](#).

### Mujina Mining Firmware:

The Mujina Mining Firmware is Linux based and built to run on the Libre Board control board and will support multi-driver compatibility to account for the various Ember One hashboards with different ASICs. Mujina will also implement [Stratum v2](#) client support.

Users will benefit from complete control over all parameters of their mining hardware, unlike the closed and proprietary manufacturer's firmware. Even after-market firmware solutions leave something to be desired when it comes to the unique customizations needed to make Bitcoin mining as efficient as possible for a given application.

This will unlock hacks like changing the main supply voltage, swapping out or removing the fans, changing ASIC voltage & frequency, and anything else the end user wants to change. If you have ever tried using a Bitcoin miner in a not-so-conventional manner then you will appreciate what Mujina Mining Firmware has to offer. Learn more at [mujina.org](#).

### Libre Board:

The Libre Board is the control board for the Ember One hashboards and will be a control board option for other miners too eventually. The control board in a miner functions just the way it sounds, it controls everything going on inside the miner. From the power supply to the fans, from the internet connection to the hashboards, everything passes through the control board. There are limitless innovations that can be unlocked by making the control board more user friendly, adaptable, and standardized.

There are going to be two pieces to the Libre Board, the I/O board piece and the compute module piece. For the I/O board piece, think of something similar to the [Raspberry Pi I/O Board](#), that has HDMI ports, Ethernet port, fan connectors, enough USB ports to power 10 Ember One hashboards, an NVME connector so users can install enough SSD storage to run a full Bitcoin node, and the standard two 100-pin connectors for the compute module piece.

Now, for the compute module piece, users could choose any device they prefer for example: the [Raspberry Pi Compute Module 5](#), or even a RISC-V solution like the [Milk-V Mars](#), or an alternative ARM solution like the [Armsom CM5](#), or the [Orange Pi CM4](#). You get the point, it's up to the user and any Linux compatible compute module will suffice. Each of the above mentioned options can be configured with different amounts of RAM for varying applications, like running a full Bitcoin node and a Stratum server locally. Learn more at [libreboard.org](#).

#### Hydra Pool:

Designed to be an easily deployable pool from the complete Ember One mining system user interface, Hydra Pool implements Stratum v2 sever support, communication with the user's local Bitcoin node, and possibly multiple payout model options.

Hydra Pool offers an assurance that in the event Bitcoin mining pools fall victim to authoritative regimes anyone could quickly spin up alternative pools thus mimicking the effect of cutting off the head of a Hydra where two heads grow back. This will also be a leap forward in moving away from the FPPS model that has become a centralizing force in the Bitcoin mining ecosystem.

Hydra Pool plans to deliver three payout models from the beginning. First is the self-hosted solo mining model where the user is using their own Bitcoin node to generate block templates and in the event they successfully solve for a block then they receive the full reward to their wallet address.

The second model will be meant for multiple participants who want to pool resources and avoid custodial handling of rewards; this model pays direct from the coinbase transaction and will not be compatible with Bitmain's miners due to their unnecessary truncation of the number of addresses that the coinbase transaction can pay out to.

The third model is based on an eCash criteria that issues tokens for valid shares and makes a similar custodial tradeoff as miners currently make when pointing their hashrate to FPPS pools; the eCash has benefits over the FPPS model in that there is no minimum threshold to receive tokens and that the tokens offer a level of transactional privacy. Learn more at [hydrapool.org](#).

#### Block Watcher:

Block Watcher is another application built to be hosted on the complete Ember One mining system, specifically designed to bring the best possible insights to miners to help them make informed decisions.

Think of Block Watcher as a dashboard combining the insights and visualization tools of [mempool.space](#), [mempool.observer](#), [fork.observer](#), and [stratum.work](#) all

powered by the user's self-hosted Bitcoin node. This could possibly be combined with a mining fleet management tool that can assist in automatic and real time response to changes on the Bitcoin network.

There will also be a public-facing dashboard that anyone can access for helpful insights. Well informed people tend to make good decisions and Block Watcher will provide insight into which templates pools are passing out, possible censorship attempts, orphaned blocks, and much more. Learn more at [blockwatcher.org](#).

#### **Actionable Advice:**

This month the focus is on mining pools and considerations one might want to keep in mind when choosing from the available options; hence the name of this month's newsletter: Swim At Your Own Risk.

Essentially the choice boils down to whether you want small consistent mining rewards or large highly-variable mining rewards. There are various options for either choice and different miners will have different reasons for one over the other. If you are unsure where to point your hashrate then hopefully this section helps you find the answers you seek.

Starting with the small consistent mining rewards; miners have operational costs and they want to earn rewards daily to help offset those costs. That's where pooled mining can be helpful, albeit a centralizing force, many miners combine their hash power and share the rewards in proportion to their contributions. Even though technically speaking, only one of those miners solves the block, all the miners share the reward and the pool collects a fee. This is where the waters start getting muddy when it comes to pooled mining.

#### FPPS:

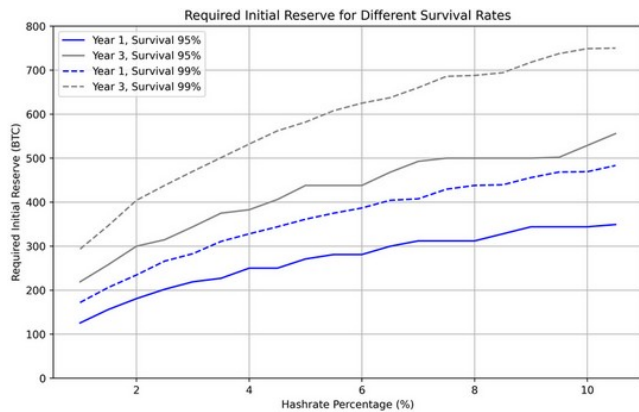
Full Pay Per Share ("FPPS") is an often sought after payout model because the pool pays miners for the block subsidy and the transaction fees based on three factors: 1) the average 144 blocks mined per day – not the actual number of blocks mined, 2) the average transaction fees in a given time window, and 3) the number of shares (proof of work) a miner has submitted to the pool during a given period. Each FPPS pool should be paying out the same amount but they all have slightly different ways for calculating the rewards and as a result there is some non-zero variance between FPPS pools.

Additionally, FPPS pools will charge a pool fee which is deducted from the miner's rewards, this fee can vary by pool but is typically 2.5%. Also, some pools will take the payout transaction fee out of the miner's rewards. At first glance FPPS seems pretty simple and sounds mostly fair, right? WRONG! FPPS has lead to some shocking centralization issues, so keep reading and do some soul

searching to figure out if this is the kind of antithetical activity you want to participate in with your Bitcoin miners.

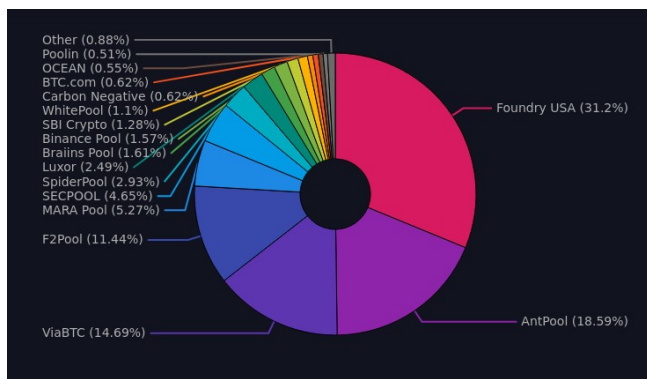
Although variance is reduced for the miner, the risk of a bad luck streak in block finds or the pool being a victim of a block withholding attack means there needs to be a stock pile of bitcoin available to cover payouts during bad times. Most pools can't afford the required bitcoin stock pile and face near-certain bankruptcy without it, thus they turn to larger pools to help backstop those risks.

There are a couple good research pieces on the driving force behind FPPS and how much bitcoin is needed for a pool to survive. One is by [OrangeSurfBTC](#) and the other is by [Bitmex](#). TL;DR: if a pool has 5% of the overall network hashrate then they need ~350 BTC to have a 99% chance at surviving their first year. Hence why so many pools choose to work with larger pools for this assurance.



[IMG-004] FPPS Reserves by @OrangeSurfBTC

On the surface, it may appear as though there are lots of pool options:



[IMG-005] Pools by ranking, 30-days, mempool.space

But under the surface, of the 16 pools depicted above at least 7 of them use the same custodian for their mining rewards. These 7 known pools represent ~40% of the network hashrate based on block finds during January 2025. In other words, 40% of the bitcoin mined went directly into [Cobo's](#) custody. In April 2024 [@mononautical](#) raised a red

flag on this topic and unfortunately not much has changed since.

If you stop and think about it, a large minority of miners are trusting a Chinese custodian to send them their mining rewards and may not be considering the potential risks of that custodian being hacked, geo-political or sanctions risks, government seizure, or overnight shotgun KYC requirements.

But that's just the beginning, the centralization problem gets worse. Soon after mononautical broke news about the mining rewards, [@0xB10C](#) revealed additional research showing that several pools were using the same mining templates. This means a centralized template provider was choosing which transactions would be included in the block templates passed out to a large portion of all the miners on the network.

[IMG-006] Templates shown on stratum.work

The image above is from the website, [stratum.work](#), maintained by Boerst. In this snapshot, there are 14 pools using the exact same template down to the 9<sup>th</sup> Merkle branch. A conservative estimate suggests these 14 pools combined have at least 30% of the overall network hashrate at the time of the snapshot. Some but not necessarily all of these pools are also using the same custodian as mentioned previously.

Evidence is starting to mount in support of the hypothesis that the financiers providing the stockpile of bitcoin to smaller FPPS pools want certain policies in place, including but not limited to which transactions are included in the pool's block templates. This is a slippery slope where those with the war chest get to decide the rules and eventually you will find yourself on the wrong side of someone else's moral superiority complex.

Even if all these pools were running the same default template generator in BitcoinCore, due to the way transactions are propagated across the network, one could reasonably expect that certain transactions may be seen by a node on one side of the world but not yet seen by another on the other side of the world and therefore differences in the Merkle branches would be expected. That is not the case here however, which supports the hypothesis that these pools are using a centralized template provider.

There is a potential risk in censorship attempts if this trend continues and if a centralized template provider decides to exclude certain transactions based on any arbitrary reason they want like [OFAC sanctions](#), [ties to political movements](#), or [social credit worthiness](#).

People will often cite a 51% attack as a prominent centralization concern, while that is a valid concern, practically speaking there seems to be a more real and present risk in miners undergoing shotgun KYC while their mining rewards are held hostage by Cobo and transactions with unsatisfactory social credit scores being the target of censorship and only confirmed by noncompliant pools and miners. Likely to the extent that compliant pools won't even build on chain tips that contain unsatisfactory transactions thus orphaning the work of noncompliant pools and miners. Perhaps compliant vs. noncompliant is the wrong framing here and something like freedom pools vs. tyrannical pools is more appropriate but you get the point.

If you are interested in learning more about FPPS pools here are a few different options: [Antpool](#), [Antpool Proxy 1](#), [Antpool Proxy 2](#), [Antpool Proxy 3](#), [Antpool Proxy 4](#), and [Antpool Proxy 5](#). Beware that in addition to the pool fee and payout transaction fee, each pool has a different threshold for the minimum payout balance a miner needs before they will send the rewards. If you have a small amount of hashrate then it can take a significant amount of time to reach that threshold and get the payouts sent to a wallet you control. Meanwhile, your hard earned mining rewards are likely in Cobo's custody.

#### PPS & PPLNS:

You may be asking yourself what other options there are if FPPS is such a mess? There are a few other reward models that attempt to lower the variance in pooled mining. Pay Per Share ("PPS") is similar to FPPS but only the block subsidy is factored in to the miner's payouts, not the transaction fees. The pool still charges a pool fee for their service in the PPS model. PPS is not a very popular option any longer.

Then there is Pay Per Last N Shares ("PPLNS"), this model calculates payouts based on a miner's shares over a given time and the blocks found during that time. This helped reduce variance risk for the pool by shifting that risk to the miners who just wouldn't earn any rewards if no blocks were found. But this payout model has faded in popularity and will likely not be making a revival, at least not in the same forms as it has been attempted in the past. Slush Pool was a PPLNS pool for a long time before they re-branded to Braiins Pool. Braiins Pool eventually shut down their PPLNS model and switched to FPPS. But recently Braiins did spin up a solo mining pool option. Braiins also offers Lightning payouts to help avoid leaving your mining rewards in their custody for long periods of time until you reach the payout threshold.

There is a number of other payout models explained in plain staking technical detail by Meni Rosenfeld in his 2011 paper titled [Analysis of Bitcoin Pooled Mining Reward Systems](#).

#### Other Reward Models:

There have also been other models introduced more recently. For example, Laurentia Pool was a project focused on decentralizing mining by addressing the custody issue of mining rewards. Instead of having one entity hold the mining rewards, Laurentia was going to payout directly from the coinbase transaction. Unfortunately, it seems as though the Laurentia project is shut down, or at least their website is no longer accessible.

The main issue with paying out from coinbase came down to, you guessed it, Bitmain! Bitmain's closed firmware made it so that only a small number of addresses could be used in the coinbase transaction. Therefore any pool with Bitmain miners on it would experience major problems. Since Bitmain controls an estimated 80-90% of the market, pretty much all pools would have this problem and hence paying directly from coinbase has gained no traction.

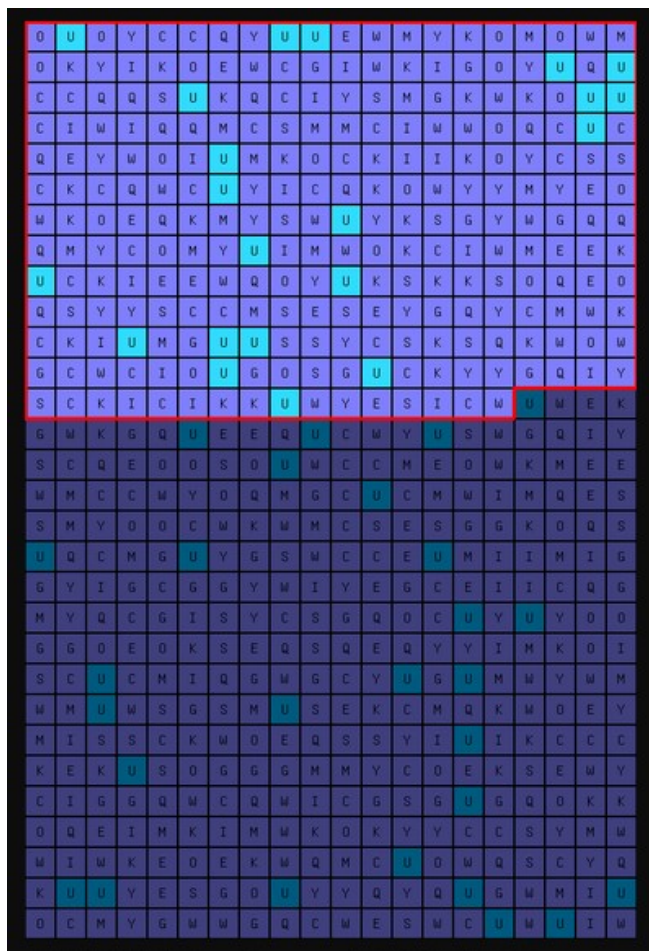
The 256 Foundation is addressing this by implementing the option to payout directly from the coinbase transaction on Ember One units running Hydra Pool. The trade off is that it won't be compatible with Antminers running stock firmware but since the goal is to sever ties to Bitmain, there's no looking back.

The most recent payout model to make a splash comes from [OCEAN](#) and it is called Transparent Index of Distinct Extended Shares ("TIDES"). OCEAN strives to make the mining rewards low variance, fair, and transparent with TIDES. In practice, every share is tracked and indexed in the order it was received from all the pool's miners. At the time a block is found, the then current network difficulty is used to define a window size equal to eight times the block's difficulty [IMG-008]. For example, current difficulty is  $\sim 114.17$  trillion  $\times 8 = 913.36$  trillion shares will be the window size. In the IMG-008 example, each lettered square represents a miner's shares in the index. The miner named "U" is highlighted showing all their shares in the whole index and the shares in the red box are the ones used for that particular block reward.

That window is placed over the share index and all shares are tallied starting from the top of the index and going backwards until the end of the window. The block subsidy and all transaction fees in the block are used to determine each miner's rewards proportional to their shares in the window. As a simple example, if block subsidy plus transaction fees equals 3.146 BTC and a miner had 1% of the shares in the window then the miner would be awarded 0.03146 BTC minus the pool fee, which is default 2% and

can be 1% if the miner chooses to make their own templates.

OCEAN does payout direct from the coinbase transaction however, the number of addresses that can be included in the coinbase transaction are limited by Bitmain's closed and proprietary firmware. Paying direct from coinbase seems to have been the justification for non-custodial marketing during OCEAN's initial launch but how the pool is handling rewards for those miners not included in the limited number of coinbase address spots is unclear and the non-custodial language seems to not be in use on the OCEAN website currently. To help smaller miners receive payouts faster, OCEAN implemented Lightning payouts.



[IMG-008] Example from OCEAN of TIDES window

OCEAN combats the centralizing transaction selection affects of FPPS pools with Decentralized Alternative Templates for Universal Mining ("DATUM") where each miner can generate their own templates with a self-hosted node and a gateway. With DATUM, individual miners get to choose how to construct the templates and which transactions to include.

Stratum v2 and DATUM share some similarities in that individual miners can reclaim the template creation function from the pool, communications are encrypted as opposed to Stratum v1 clear-text, and both frameworks have increased data efficiencies. The differences between Stratum v2 and DATUM are not entirely clear but they are completely separate frameworks.

#### Solo Mining:

Solo mining has been a hot topic on the socials recently, there seems to be disagreements over what "solo" actually means in the context of mining. Some would say that solo mining means one miner receives the block rewards. Others say that solo means the miner is generating their own templates. Neither one is wrong but for clarification these ideas can be unpacked further.

Where most miners are choosing FPPS for the small consistent mining rewards solo mining is what miners would choose for large highly-variable mining rewards. Consider a scenario where the operating costs for your miner are negligible, like running a [Bitaxe](#); would you rather earn a few sats per day and never earn anything more or would you rather take your chances at winning the whole block? Running a small miner to have a chance at winning the lottery every 10-minutes sounds much more appealing to a lot of people.

There are several options for solo mining: you can self-host your own node and stratum server, as [demonstrated](#) in the January newsletter; in which case you are doing self-hosted solo mining. You run the Bitcoin node, generate the templates, broadcast the block to the rest of the network, and you get all the reward for taking on all the risk. This is the most accurate use of the term "solo" in this author's opinion because there is one entity receiving the reward and one entity involved with the template generation and block propagation.

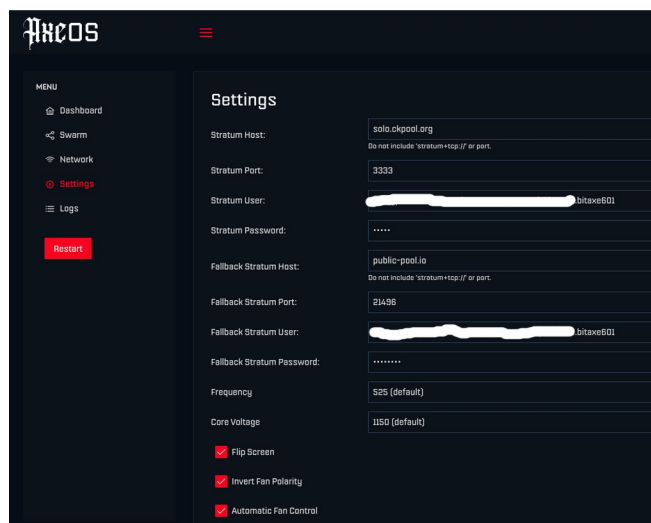
Or you can join a solo mining pool like [CK Pool](#), [Public Pool](#), or [Brains Solo Pool](#); in which you are pooled solo mining. You run the miner but the pool provides the Bitcoin node, generates the templates for you, and broadcasts the block with their likely better connected infrastructure. CK Pool takes a 2% fee for their service, Braiins is probably 2% but it doesn't seem to be displayed on their website, and Public Pool doesn't charge a fee. This is a less accurate use of the term "solo" because a pool is involved but because one miner is getting the reward, it is still a form of solo mining none the less.

Or you can even join OCEAN; in which case you are also pooled solo mining according to [some](#). You run your own Bitcoin node and DATUM gateway, generate your own templates, and the pool broadcasts the block. Apparently the miner can choose to share the reward with the rest of the pool or not. In this scenario, the pool would take a 1% fee.

This also is a less accurate use of the term “solo” because a pool is involved but because each individual miner is making the template, it is still a form of solo mining none the less.

Whatever you decide to do, whether you’re getting all the rewards or making your own templates or both, it is perfectly acceptable to call it solo mining.

Here is an example of configuring a Bitaxe to solo mine on solo CK Pool with Public Pool as a fallback: open your settings page and set the pools URL in the “stratum host” field being sure to leave out the “stratum+tcp://” part. Then add the port number as indicated by the pool’s website in the “stratum port” field. For the “stratum user” field, insert your bitcoin address, you can append this with a worker name like “.bitaxe” for example. Save those changes and restart the miner.



[IMG-009] Bitaxe Settings Dashboard

### State of the Network:

Hashrate on the 14-day MA according to [mempool.space](https://mempool.space) increased from ~786 Eh/s to ~787 Eh/s in January, marking ~1.2% growth for the month. Just in the first half of February, hashrate has climbed 45 Eh/s to peak at 832 Eh/s on the 14-day MA.



[IMG-010] 2025 hashrate/difficulty chart from mempool.space

Difficulty is currently 114.16T as of Epoch 438 and set to decrease roughly 0.3% on or around February 23, 2025. But that target will change between now and then. The previous

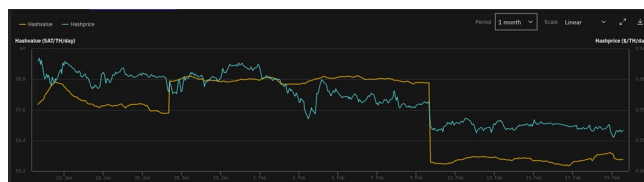
re-target increased difficulty by 5.6%. All together for 2025 thus far, difficulty has gone up 4.4%.

New-gen miners are selling for roughly \$24.09 per Th using the Bitmain Antminer S21 Pro 234 Th/s model from [Kaboom Racks](https://KaboomRacks.com) as an example. According to the [Hashrate Index](https://HashrateIndex.com), more efficient miners like the <19 J/Th models are fetching 18k sats per terahash, models between 19J/Th – 25J/Th are selling for 13k sats per terahash, and models >25J/Th are selling for 3,500 sats per terahash.



[IMG-011] Miner Prices from Luxor's Hashrate Index

Hashvalue is currently ~56,000 sats/Ph per day, down slightly from January when hashvalue was closer to 58,000 sats/Ph per day according to [Braains Insights](https://BraainsInsights.com). Hashprice is \$53.00/Ph per day, down from \$62.00/Ph per day in January.



[IMG-012] Hashprice/Hashvalue from Braains Insights

The next halving will occur at block height 1,050,000 which should be in roughly 1,122 days or in other words 165,570 blocks from time of publishing this newsletter.

### Conclusion:

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If you were looking for answers about Bitcoin mining pools then hopefully you found them here.



Stay vigilant,  
-econoalchemist