I ran this poll as a precursor to release some analysis I did a while ago attempting to see what kind of return a company can expect when investing today in a leading mining rig – a S21 XP. This machine, per Bitmain, pulls 13.5 J/Th and cost, Per an Iren purchase statement, $21 per Terahash ($5,684 per rig).

Now comes the fun part – trying to predict mining economics over the next few years. I am cutting this analysis at the next halving date (by end of April 2028) when these rigs will probably close to worthlessness.

**Assumptions:**

1. A graph of a mining efficiency

   Description automatically generated**Mining rigs continue to get more efficient:** This should be pretty consensus. The data I used for the chart is found here - <https://www.jbs.cam.ac.uk/2023/bitcoin-electricity-consumption/>
2. **Transaction fees stay consistent:** For this model we are using total block rewards of 3.3. I don’t see how you can model this, but they can really only go up so its all upside.
3. **Operations:** I am going to assume we maintain 100% uptime over the period, but the operator will also mine at a negative gross margin if economics proceed that way (should only happen in the bear case).

**Modeling/Projections:**

**BTC Price:** To showcase different scenarios I attempted to model for a bear, base and bull case for the price of Bitcoin over the next 3.5 years. The logic follows:

* Bear: BTC is basically rangebound from $60K and $70K for the next 3.5 years.
* Base: BTC hits $150K early 2026 and trades down to somewhere between $75K to $125K by the end of the period.
* Bull: BTC hits $250K early 2026 and trades down to somewhere between $125K to $175K by the end of the period.

A graph showing the growth of a stock market

Description automatically generatedQuite frankly pulling those numbers out of my ass, but really no one knows what can/will happen. I then threw in some Brownian motion and adjusted the vol based on historical time periods for each case (blah blah) and got something like this.

**Global Hash Rate:** This is the part I struggled with the most. As BTC appreciates it can drive global hash rate up to a certain point, but it then gets to a point where machines/power cannot be supplied fast enough to account for the price appreciation. Especially considering expected power usage for AI, it seems like there will be more power/data center shortage going forward – this makes it hard to quantify (I did dampen the predictions – Hash rate tripled over the last 2 years and I can’t see that happening again). However, mining rigs will continue to get more efficient and naturally push up global hash rate.

Using the Bitcoin projected price, efficiency frontier curve and historical block rewards as inputs, this is what I am going to assume for global hash rate. So the base case is more than double of network hash rate over 3.5 years.

A graph of a graph showing the growth of the stock market

Description automatically generated

**S21 XP Return:**

Based on previous inputs here are the results (vs if you put that money directly into Bitcoin of course). For the bulls out there that said 200-300%, hope you are bitcoin bulls as well.

\*This is also assuming the rigs are worthless at the end of the period

A graph of different colored lines

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