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QFRG
Quantitative Finance Research Group

WHY YOU SHOULD NOT INVEST IN BTC MINING*

- *Why enormous amounts of money are wasted on BTC mining enterprises which are not profitable?*
- *Is it reasonable that Venture Capital firms invest in BTC mining endeavours?*
- *Are you really satisfied with your BTC mining investments?*
- ✓ *Answers to these questions can be found in this presentation!*

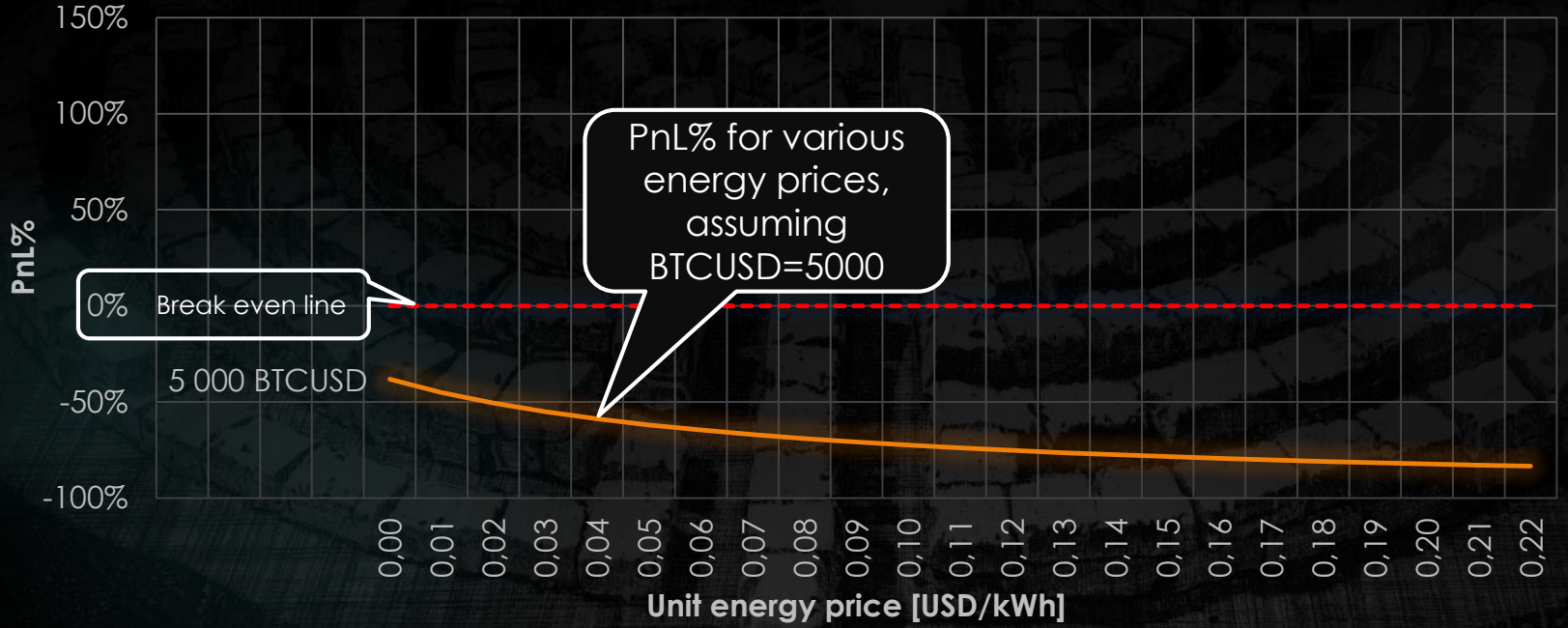
by LHF project and QFRG WNE UW

August, 2018

* based on research "Why you should not invest in mining endeavour? The efficiency of BTC mining under current market conditions.", available on http://qfrg.wne.uw.edu.pl

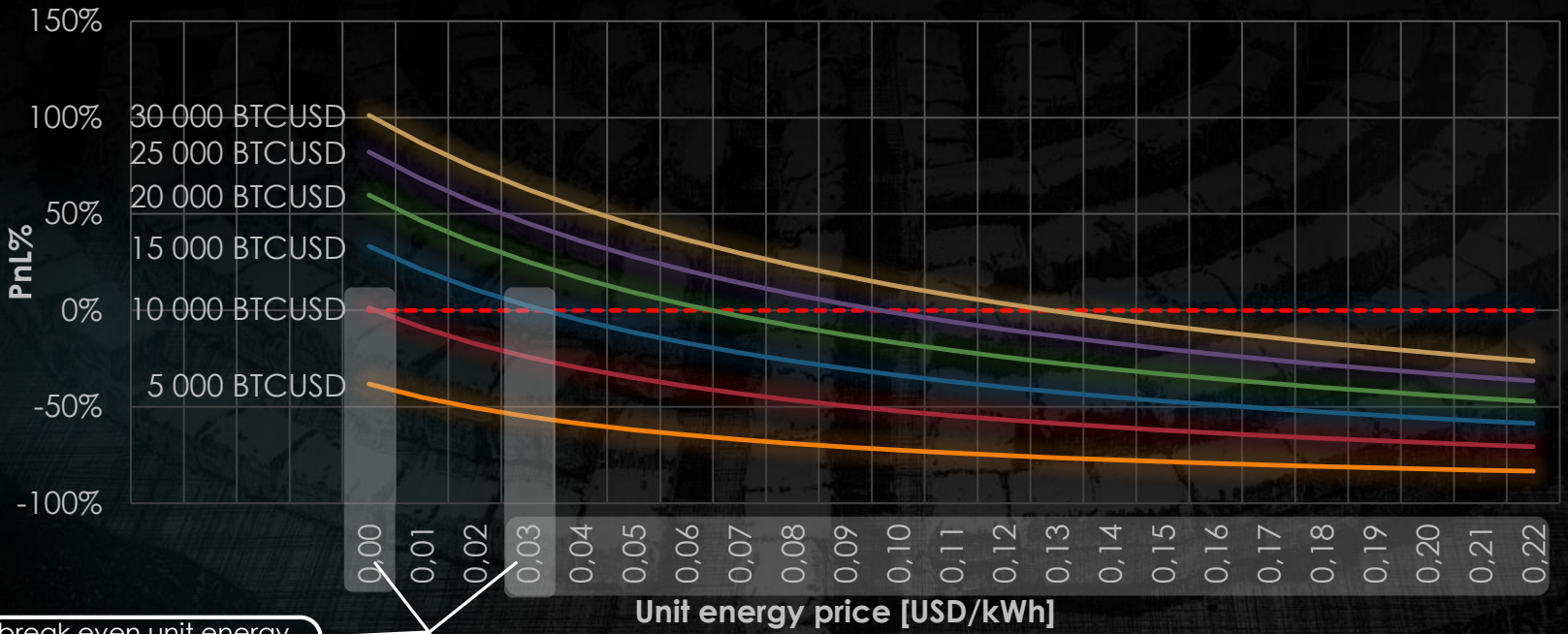
** Labyrinth Hedge Fund Project, http://www.labyrinthhf.com/

BTC mining profitability (PnL%) for different levels of unit energy price and set of fixed BTCUSD prices




Losing money for BTC = 5,000 USD?
How about other BTCUSD levels?

BTC mining profitability (PnL%)
for different levels of unit energy price and set of fixed BTCUSD prices



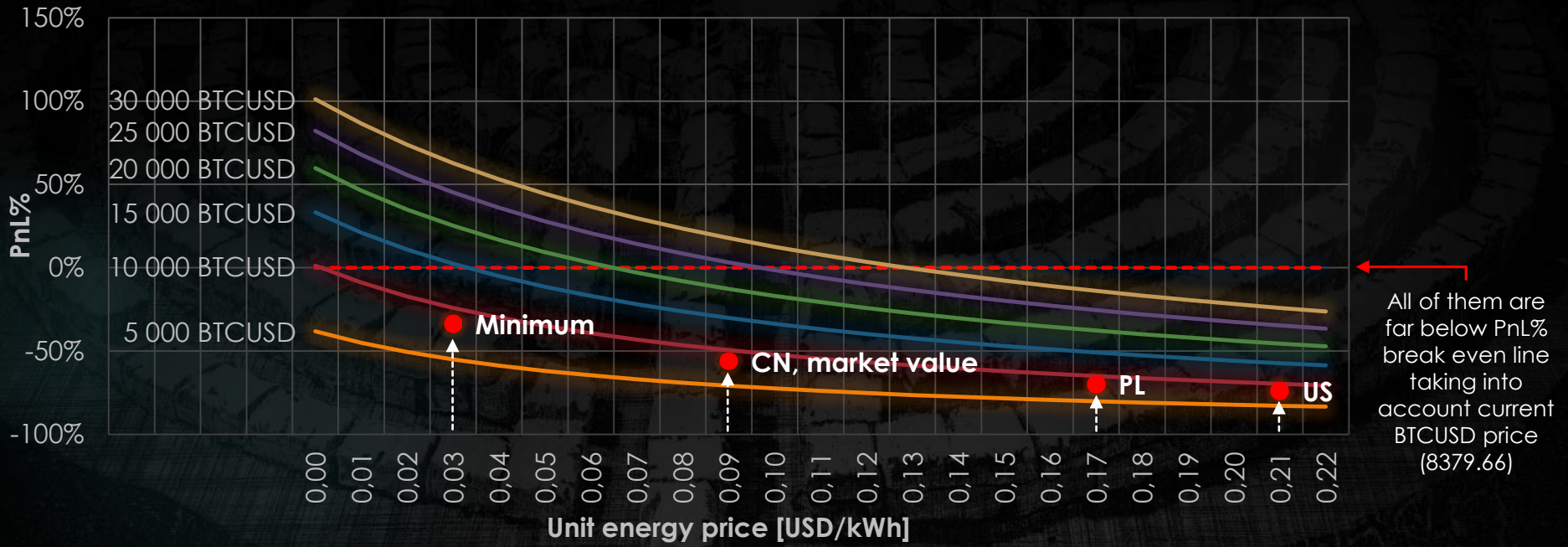
break even unit energy prices for BTCUSD equals 10000 USD and 15000 USD

How energy efficient is your mining business?

And what are the actual PnL% for various locations?

CN	– China
US	– United States
PL	– Poland
Minimum	– minimum available energy price

BTC mining profitability (PnL%)
for different levels of unit energy price and set of fixed BTCUSD prices



Note that each location corresponds to its energy price

Still believe in making money on BTC mining?

Watch this three minute guide on mining profitability

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Key hypothesis

Is BTC mining profitable under current* mining conditions?

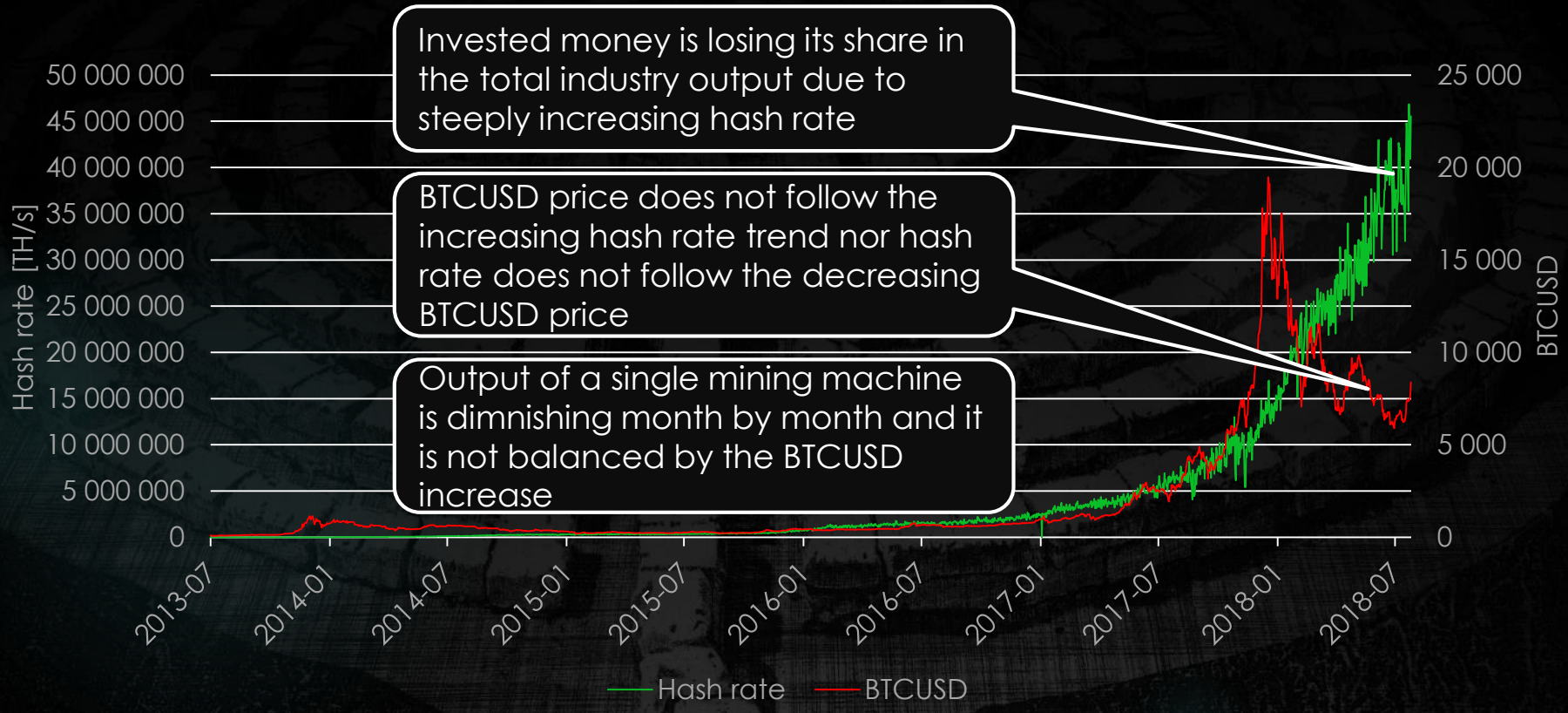
- **NO**
- Current PnL% is **-56%**
- Controversial vs mainstream information? Please watch the following analysis

* current means as of 25th of July 2018

On the next slides you will see:

- charts with sensitivity of BTC mining profitability to initial assumptions and future trajectories of main parameters
- what are break even levels of the main BTC mining parameters to make this activity profitable
- a piece of trivial maths for those who need a hard proof to believe

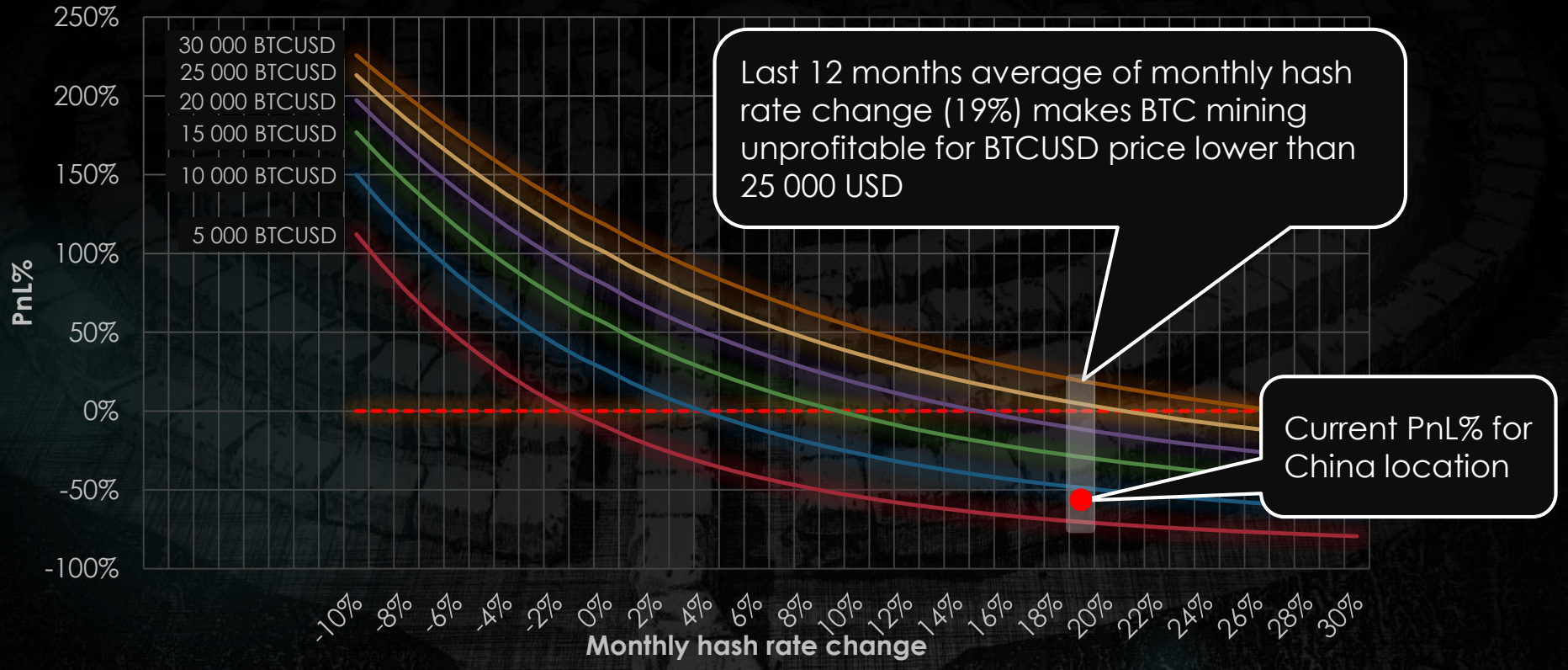
Market environment: Hash rate and BTCUSD



PnL% sensitivity to monthly hash rate change and set of fixed energy prices

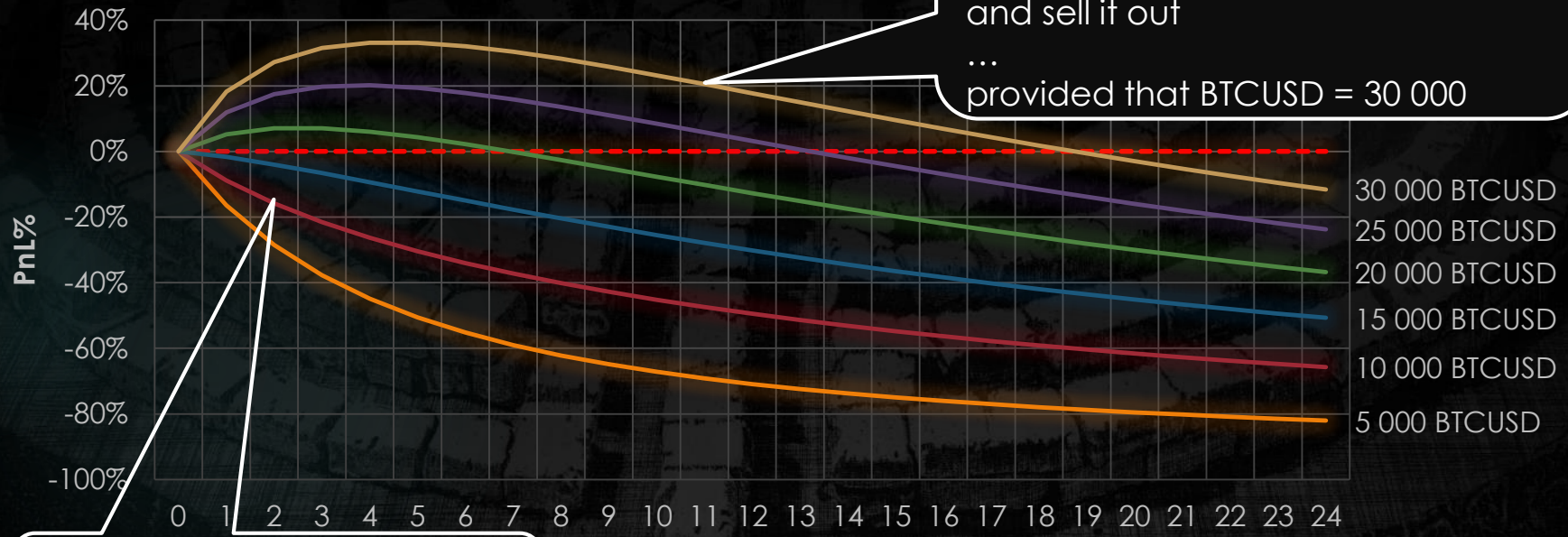


PnL% sensitivity to monthly hash rate change and set of fixed BTCUSD prices



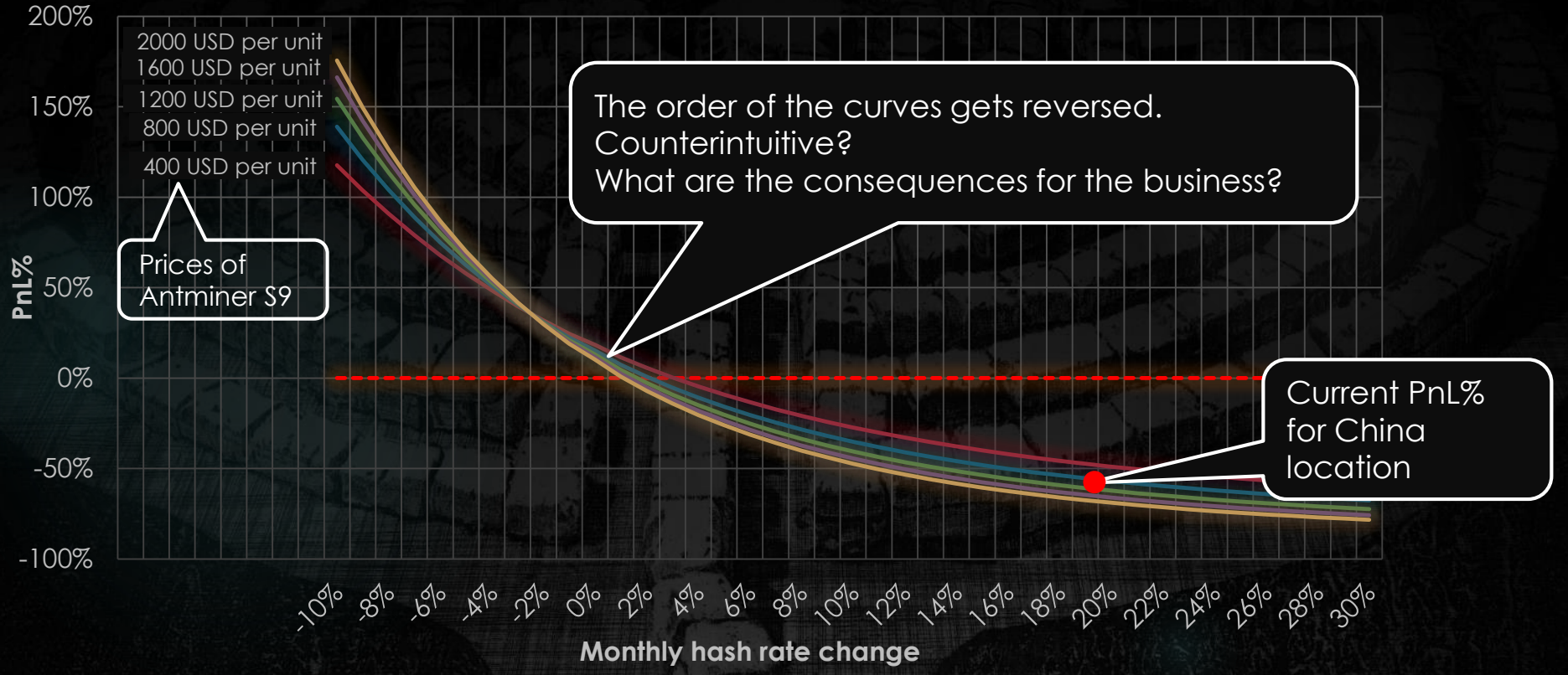
PnL% sensitivity to amortization period and set of fixed BTCUSD prices

If you require hurdle rate = 20% it means that after 11 months you should switch off mining machine and sell it out
…
provided that BTCUSD = 30 000



For 1 BTC = 5 000 USD you are losing money regardless of investment period

PnL% sensitivity to monthly hash rate change and set of fixed prices of mining machine



To answer your business questions and see more profitability charts please see research paper on:

http://qfrg.wne.uw.edu.pl

And what are the break even points to make mining profitable? (if other parameters remain constant)

BTC = **23.958** USD (currently **8.379 USD**)

or

Monthly BTC network hash rate change = **2.12%** (currently **19.5%**)

or

Fees defined as % of BTC mined = **169%** (currently **10.35%**)

or

Breakthrough in mining machines technology

And now a piece of trivial maths for those who need a hard proof to believe

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A bit* of trivial mathematics – key formulas

BTC mining PnL% = (Amount earned - Amount invested) / Amount invested

Amount earned [USD] = Value of BTC mined per year [USD] +
Transaction fees received per year [USD] +
Residual value of hardware after one year [USD]

Amount invested [USD] = Energy cost per year +
Hardware cost +
Maintenance cost per year

Value of BTC mined per year [USD] $= \mathrm{BTCUSD} * \frac{\text{Theoretical BTC mined per year}}{12} * \frac{\text{Hardware hash rate}}{\text{BTC network hash rate}} * \frac{1-\frac{1}{(1+d)^{12}}}{1-\frac{1}{1+d}}$

d = 1Y avg of monthly BTC hash rate change%,

Theoretical BTC mined per year = Theoretical BTC blocks mined per hour * BTC block reward · Days per year * Hours per day

Transaction fees received per year [USD] = 1Y avg of Fees% * Value of BTC mined per year [USD]

Residual value of hardware after one year [USD] = % of new Hardware cost * Hardware cost [USD]

Hardware net price [USD] = Mining machine net price [USD] + PSU net price [USD]

% of new hardware cost = estimated Hardware cost after 12 months / current Hardware cost = $\frac{1}{(1+d)^{12}}$

Energy cost per year = (Hardware power consumption [W] / 1000) · Unit energy price [USD/kWh] * Days per year * Hours per day

Hardware cost [USD] = Hardware net price [USD] * (1 + Taxes&Shipment%)

Maintenance cost per year [USD] = Maintenance ratio% * Value of BTC mined per year [USD]

* For detailed model description please see original research paper

A bit* of trivial mathematics – key assumptions

Mining machine (Antminer S9) net price	= 564 USD
PSU net price	= 90 USD
Taxes&Shipment%	= 23%
Amortization period	= 12 months
Hardware hash rate (Antminer S9)	= 13 TH/s
Hardware power consumption	= 1293 W
Unit energy price	= 0.09 USD/kWh
Maintenance ratio%	= 25%
BTCUSD price	= 8379.66
BTC network hash rate	= 4 560 000 TH/s (as of 25th July 2018)
d	= 19.5%
1y avg of Fees%	= 10.3%
Theoretical BTC mined per year	= 625 000 BTC

* For detailed model description please see original research paper

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Need more insight into crypto financial engineering?

Analyses for other cryptocurrencies?

Interested in LHF project, a „rocket science” in the advanced investment algo strategies?

Feel free to contact us:

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Unfortunately, we have not been able to answer one of the initial questions:

Why enormous amount of money is wasted on BTC mining enterprises which are not profitable?

…but we can give you just one advice...

Prepare professional analysis before investing money no matter how sexy the business might look like

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Authors and contact details

For the detailed analysis please refer to the research paper:

Why you should not invest in mining endeavour?
The efficiency of BTC mining under current market conditions.

The full text:
http://qfrg.wne.uw.edu.pl

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