Cryptocurrency

The fourth industrial revolution?

What are cryptocurrencies?

What came before cryptocurrencies?

- ▶ Failed attempts at creating digital currencies

- ▶ Only 8% of money in the world exists as physical cash (Grabianowski, 2003)

- ▶ When you're sending someone money, nothing physical happens, a digital ledger is just being updated
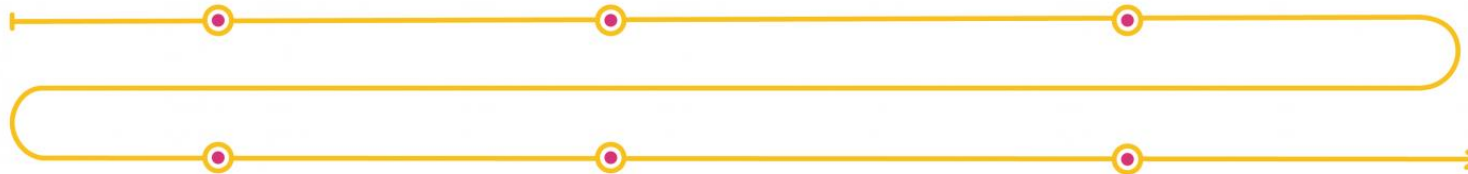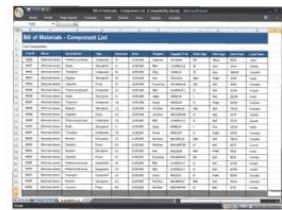
We've always used ledgers
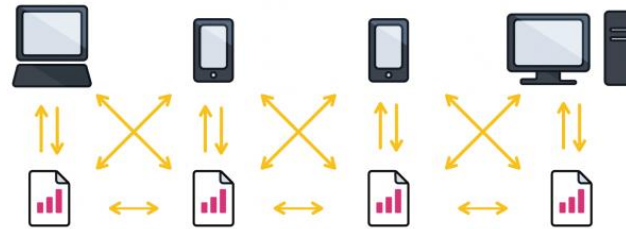

clay tablets

papyrus

tally sticks

double entry book keeping

spreadsheets

distributed ledger

(Coindesk, 2017) coindesk

The creation of Bitcoin

▶ First released in 2009

▶ Created by an anonymous group under the pseudonym 'Satoshi Nakamoto'

▶ Acts as a distributed ledger, removing the need for a central authority

▶ Introduced the world to Blockchain technology

(Waggoner, 2018)

What is a blockchain?

▶ Transactions are bundled together into a block

▶ Each block links to the one before it and after it

▶ Transactions are blocked together creating a transparent and unalterable chain

Linked Blocks

(Pluralsight, 2018)
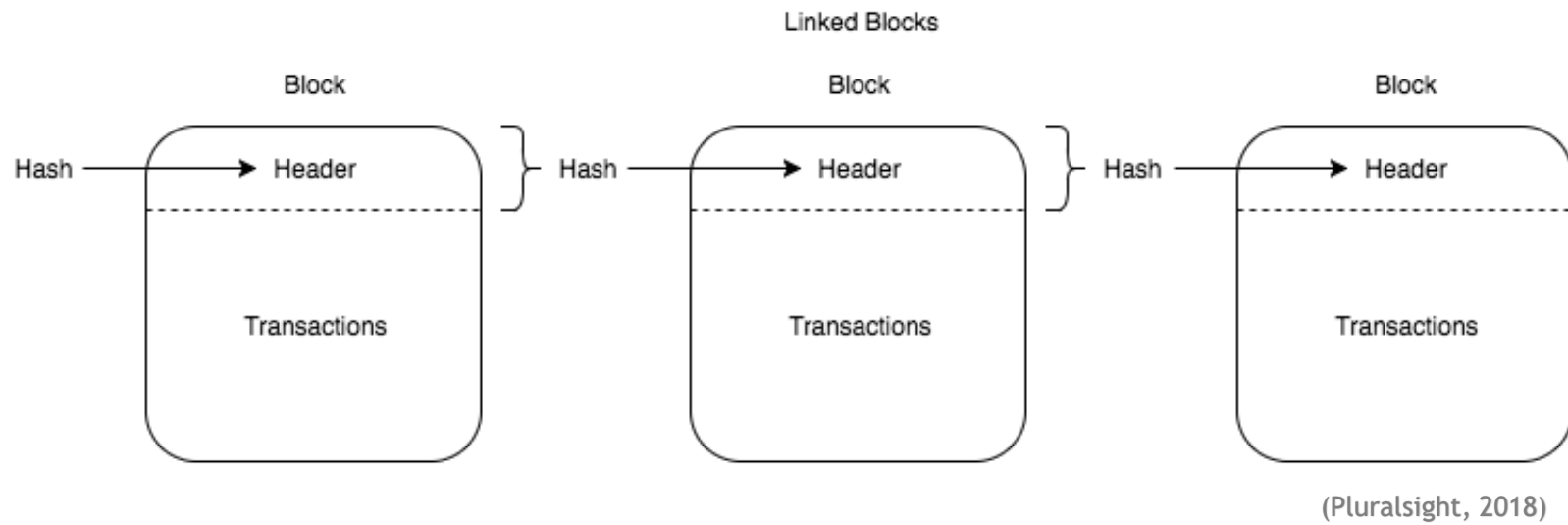
Mining

- People contribute their computational power to the network to maintain the ledger and add new transactions

- This is known as mining

- Miners are rewarded with new coins

- Relies heavily on cryptography, particularly hash functions

- Typically miners use graphics cards

(Cryptosrus, 2018)

Smart contracts – an evolution

- ▶ Ethereum was released in 2015

- ▶ Built upon the blockchain technology that Bitcoin introduced

- ▶ Added 'Smart Contracts'

- ▶ 'Smart Contracts' are pieces of software that contain rules and regulations for negotiating the terms of a contract

- ▶ Use cases such as banking and financial services, prediction markets, replacing Escrow, and identity management

The benefits of using blockchain technology

- ▶ Increased transparency
- ▶ Enhanced security
- ▶ Improved traceability and auditability
- ▶ Reduced costs

How are cryptocurrencies being used?

Examples of projects: **PowerLedger**

- ▶ Australian blockchain-based cryptocurrency and energy trading platform

- ▶ Allows for decentralized selling and buying of renewable energy.

- ▶ The platform provides consumers with access to a variety of energy markets around the globe and is meant to be scalable to various energy infrastructures and regulations.

- ▶ Can be used for frictionless transactions in the energy exchange market

- ▶ Raised A$34M

Examples of projects: **Veridium**

- Aims to create a blockchain-based voluntary carbon credits marketplace

- Partnered with IBM

- Developing a protocol that allows companies to seamlessly offset the environmental impact of their activities.

- Aims to raise $30M

Examples of projects: **WePower**

▶ Developing an Ethereum-based platform to fund renewable energy projects through the sale and trading of the "tokenized" energy produced by those systems

▶ Recently tokenized a year's worth of Estonian grid data, marking a world first for energy blockchain technology.

we power

Other real-world uses

▶ IBM has dedicated around 1,600 employees to working on Blockchain projects (Khan, 2018)

▶ The World Food Programme using blockchain to save US$40,000 per month while transferring funds to beneficiaries (WFP, 2017)

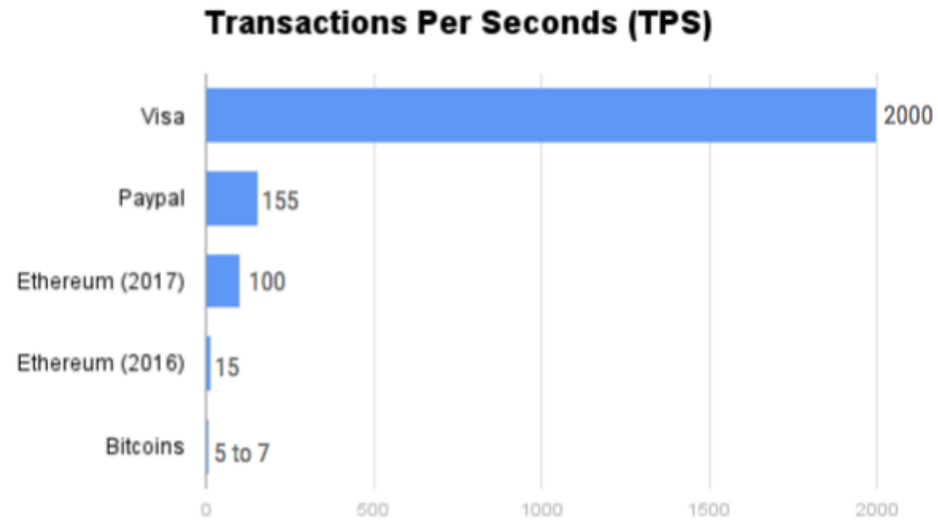▶ Walmart is using blockchain supply chain management technology to improve food safety (NYT, 2018)

Problems with cryptocurrencies

Problems with Cryptocurrencies

- ▶ Scaling problems
- ▶ Exchanges are vulnerable to hacks
- ▶ ICO scams
- ▶ Lack of regulation
- ▶ 51% Attacks
- ▶ Energy use

Transactions Per Seconds (TPS)

Platform	TPS
Visa	2000
Paypal	155
Ethereum (2017)	100
Ethereum (2016)	15
Bitcoins	5 to 7

(Golbant, 2017)

Bitcoin mining now consumes more electricity than 159 countries
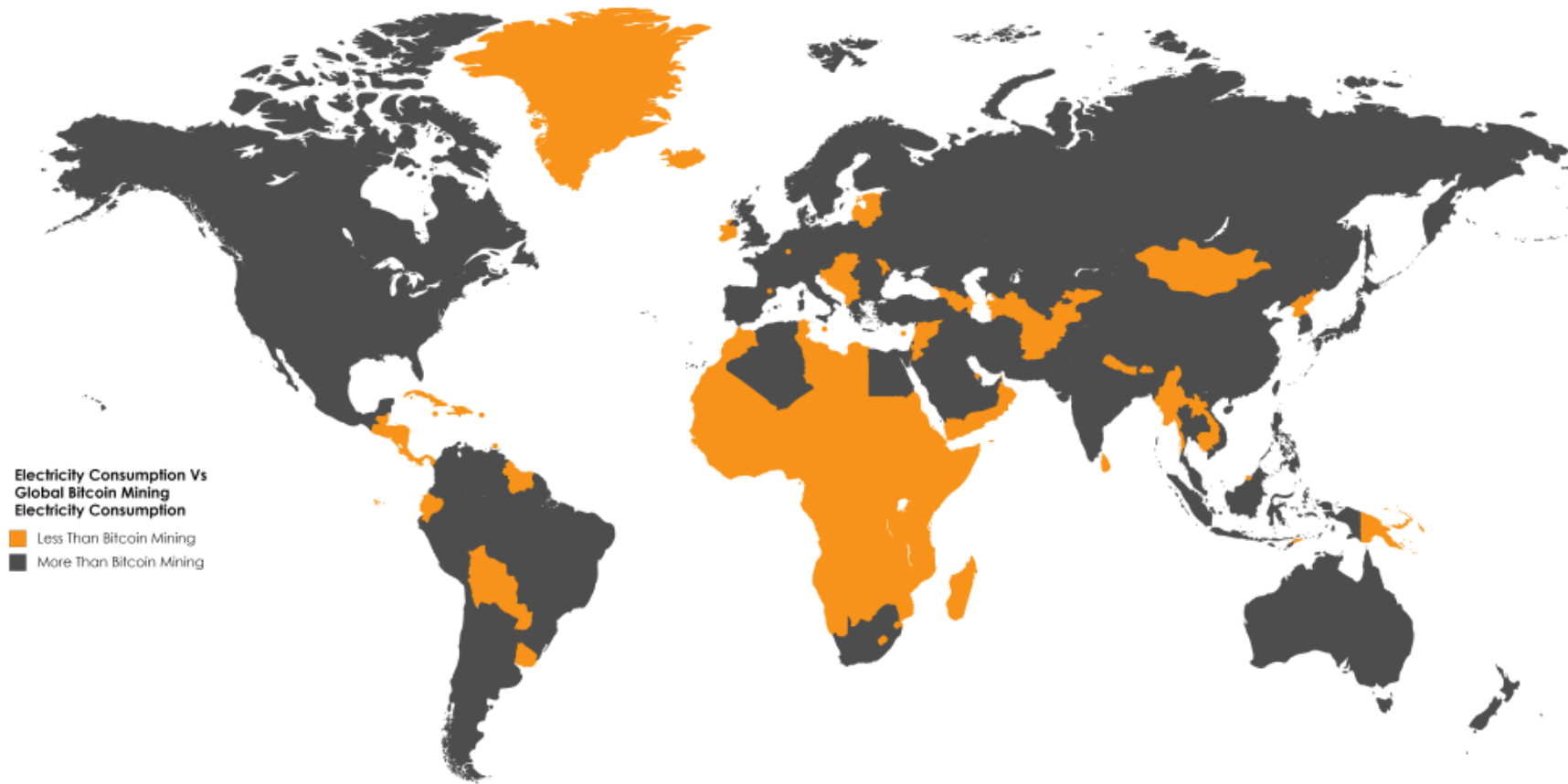
**Electricity Consumption Vs
Global Bitcoin Mining
Electricity Consumption**

■ Less Than Bitcoin Mining
■ More Than Bitcoin Mining

Source: https://powercompare.co.uk/bitcoin/

Energy problems – VISA comparison

Bitcoin network versus VISA network average consumption
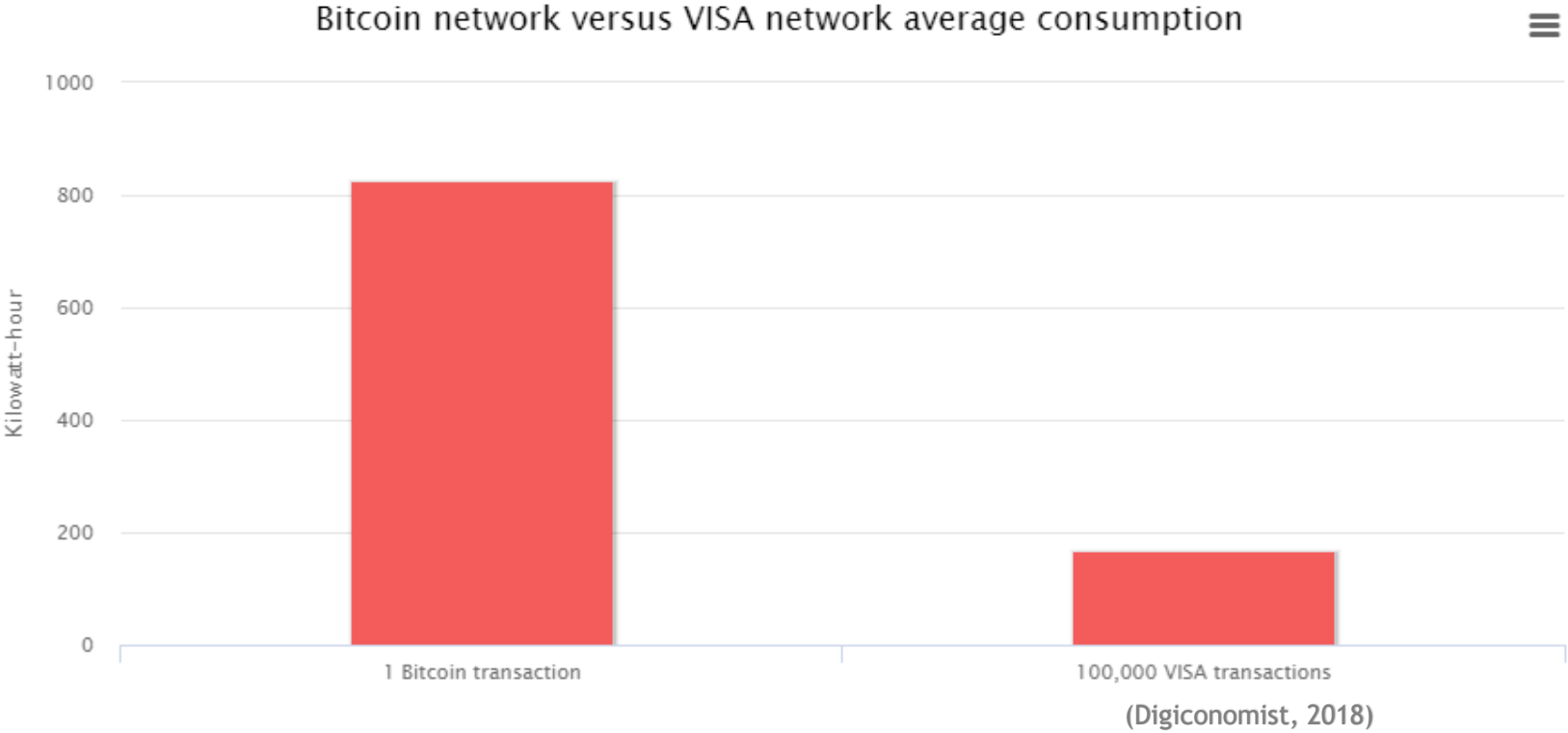
(Digiconomist, 2018)

Bitcoin is constantly becoming harder to mine

Bitcoin Difficulty Chart and Graph

Bitcoin (BTC) Difficulty Chart

Zoom 1d 1w 1m 3m 6m **All**

From Apr 28, 2018 To Oct 29, 2018

7T
6T
5T
4T
3T

7. May   21. May   4. Jun   18. Jun   2. Jul   16. Jul   30. Jul   13. Aug   27. Aug   10. Sep   24. Sep   8. Oct   22. Oct

May '18   Jun '18   Jul '18   Aug '18   Sep '18   Oct '18

Highcharts.com
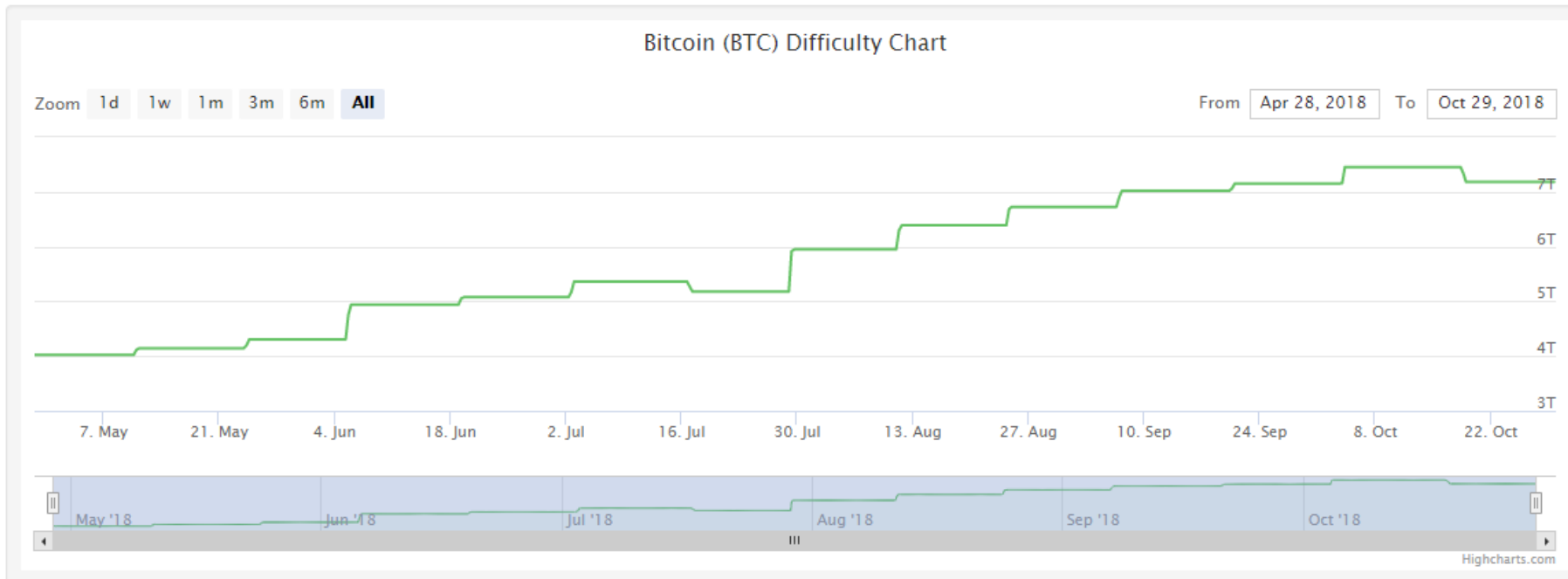
(CoinWarz, 2018)

Energy problems
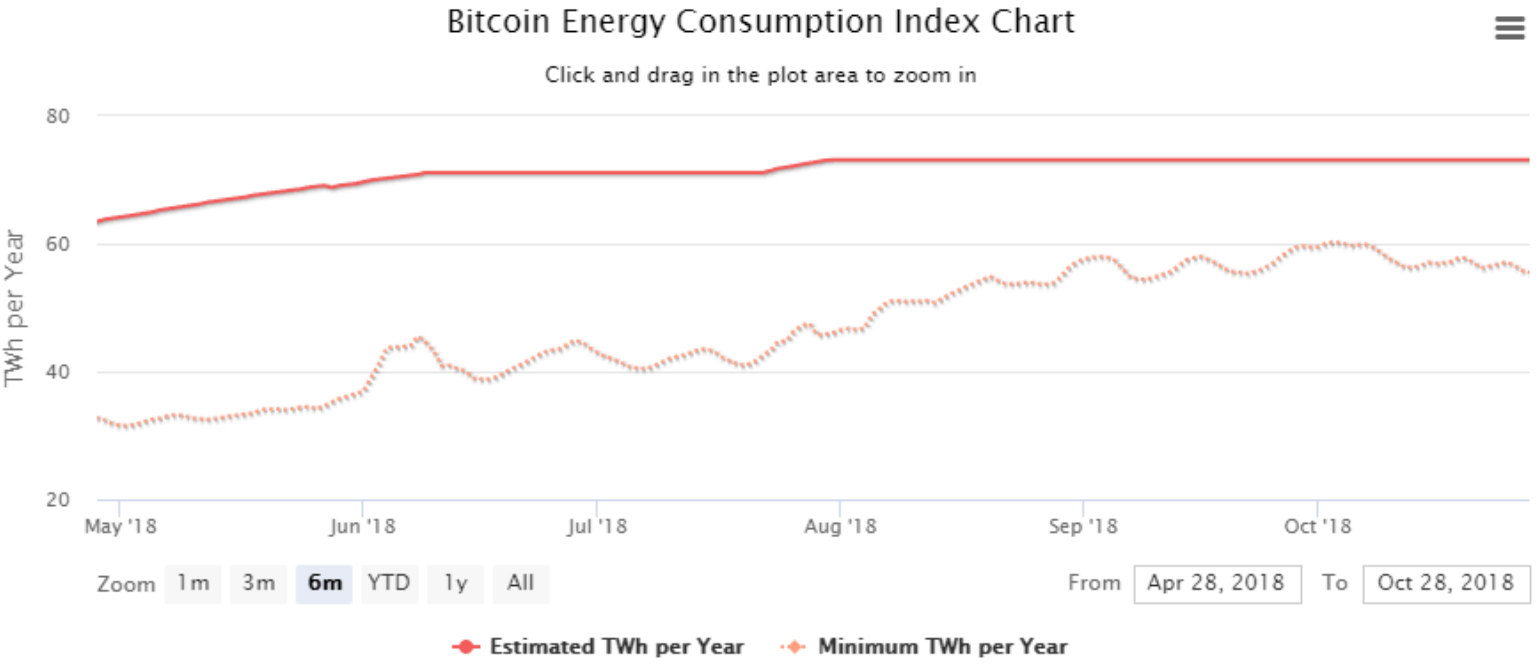
(Digiconomist, 2018)

Mining facts and figures

Description	Value
Annualized global mining revenues	$4,725,158,690
Annualized estimated global mining costs	$3,656,073,069
Current cost percentage	77.37%
Country closest to Bitcoin in terms of electricity consumption	Austria
Number of U.S. households that could be powered by Bitcoin	6,770,506
Number of U.S. households powered for 1 day by the electricity consumed for a single transaction	27.93
Bitcoin's electricity consumption as a percentage of the world's electricity consumption	0.33%
Annual carbon footprint (kt of CO_2)	35,830
Carbon footprint per transaction (kg of CO_2)	404.89

(Digiconomist, 2018)

Could you mine on a home computer?

Currency

BTC | **ETH** | ETC | XMR | ZEC | PASC | DASH | LTC | DCR

Calculated for
1 ETH = $ 194.94

Hashing Power

| 21 | MH/s ▼ |

Power consumption (w)

| 120 |

Cost per KWh ($)

| 0.1641 |

Pool Fee (%)

| 1 |

PROFIT RATIO PER DAY

-35%

PROFIT PER MONTH

$ -4.95

	Profit per day	Mined/day	Power cost/Day
Day	**$ -0.2** Pool Fee $ 0.003106	Ξ 0.001593	$ 0.4726
Week	Profit per week **$ -1.16** Pool Fee $ 0.02174	Mined/week Ξ 0.01115	Power cost/Week $ 3.31
Month	Profit per month **$ -4.95** Pool Fee $ 0.09318	Mined/month Ξ 0.04780	Power cost/Month $ 14.18
Year	Profit per year **$ -60.26** Pool Fee $ 1.13	Mined/year Ξ 0.5816	Power cost/Year $ 172.50

(Cryptocompare, 2018)

What are the pros using for mining?

Innosilicon Terminator T2 + PSU DCR 17.2TH/s ASIC

	Price	Hash Rate	Coin	Annual Minings	Payback
	$ 1,282.29	17,200.0 GH/s	₹ DCR	$ 4,042.53	115 days

MICROBT WHATSMINER D1 + PSU DCR 44TH/s ASIC

	Price	Hash Rate	Coin	Annual Minings	Payback
	$ 4,349.00	44,000.0 GH/s	₹ DCR	$ 12.25 k	129 days

MICROBT WHATSMINER D1 + PSU DCR 44TH/s ASIC

	Price	Hash Rate	Coin	Annual Minings	Payback
	$ 4,330.00	44,000.0 GH/s	₹ DCR	$ 12.25 k	129 days

MICROBT WHATSMINER D1 + PSU DCR 44TH/s ASIC

	Price	Hash Rate	Coin	Annual Minings	Payback
	$ 4,872.73	44,000.0 GH/s	₹ DCR	$ 12.25 k	145 days

(Cryptocompare, 2018)

What does the future hold for cryptocurrencies?

What does the future hold for cryptocurrencies?

Total Market Capitalization

(Coinmarketcap, 2018)

How will it compare to the dotcom bubble?

Bitcoin Price History vs NASDAQ Tech Bubble

Elementus.io

Source: Yahoo Finance, CoinMarketCap

(Elementus, 2018)

Blockchain predictions

▶ A report co-published by the World Economic Forum found that blockchain's distributed ledger technologies and other "fourth industrial revolution" technologies offer new efficiencies which could lead to a **US$1 trillion dollar** improvement in the global trade finance gap. (WEF, 2018)

▶ A study conducted by market intelligence firm Juniper Research indicates that by deploying blockchain technology financial institutions stand to generate savings amounting to over US$27 billion on cross-border settlement transactions before the end of 2030. (Juniper, 2018)

▶ Regulations are slowly being agreed upon

▶ New technologies such as sharding can drastically reduce scalability problems

▶ Alternatives to mining such as "Proof of Stake" will greatly reduce energy consumption by networks

Questions

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