Unlocking the Chain

Blockchain from an engineer's perspective

Dr Tom Dwyer

tom@tomdwyer.uk

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About me

Technophile

BEng in Motorsport Engineering

PhD in Automotive Engineering

Decade in automotive industry

5 years following Bitcoin

9 months as Blockchain Development Engineer

Why Bitcoin

Distributed and decentralised

Transparent

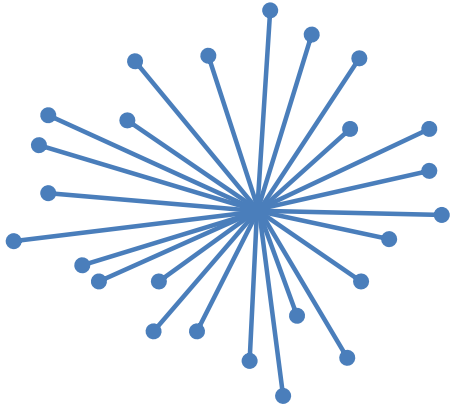
Trustless

Immutable

Positively disruptive technology

Why Bitcoin: Distributed and Decentralised

Centralised

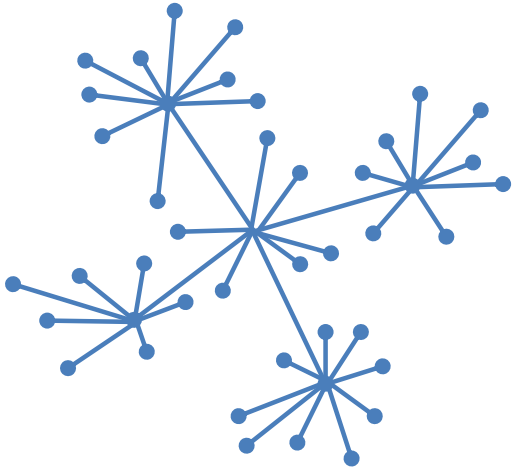


e.g. Television

Easy to control

Easy to manipulate

Decentralised

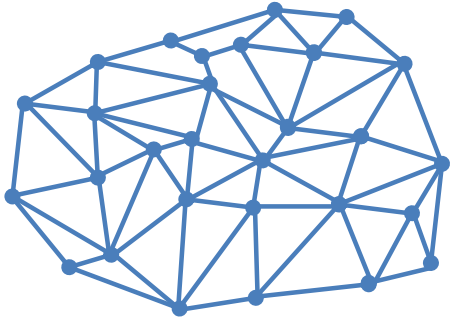


e.g. YouTube

Harder to control

Harder to manipulate

Distributed



e.g. Home media

Hardest to control

Hardest to manipulate

Why Bitcoin: Transparent

Accountability

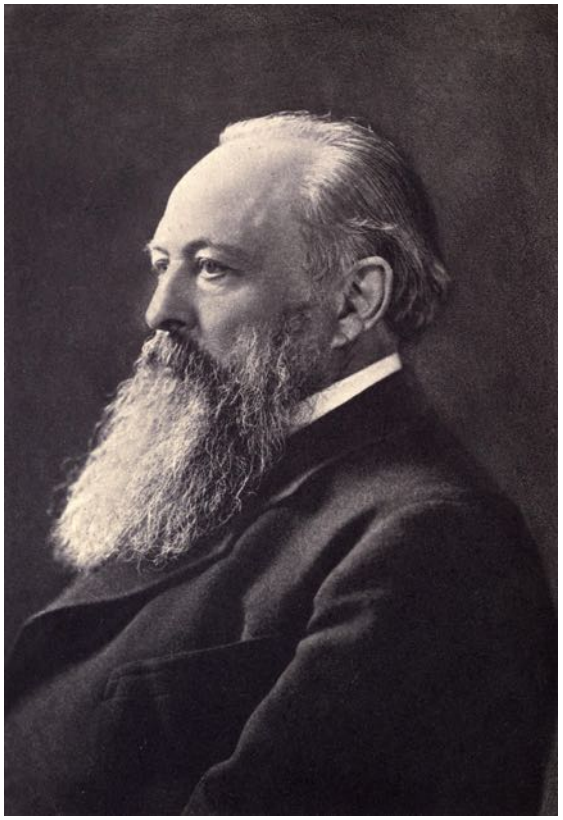
Open source
Source code: https://github.com/bitcoin/bitcoin
Every single tx: https://www.blockchain.com/explorer

Collaborative development community

Very low barrier of entry

Why Bitcoin: Trustless

"Power tends to corrupt, and absolute power corrupts absolutely" – Lord Acton



Don’t trust. Verify.

Why Bitcoin: Immutable

Embedded security

No anti-virus required

Valid data exists forever

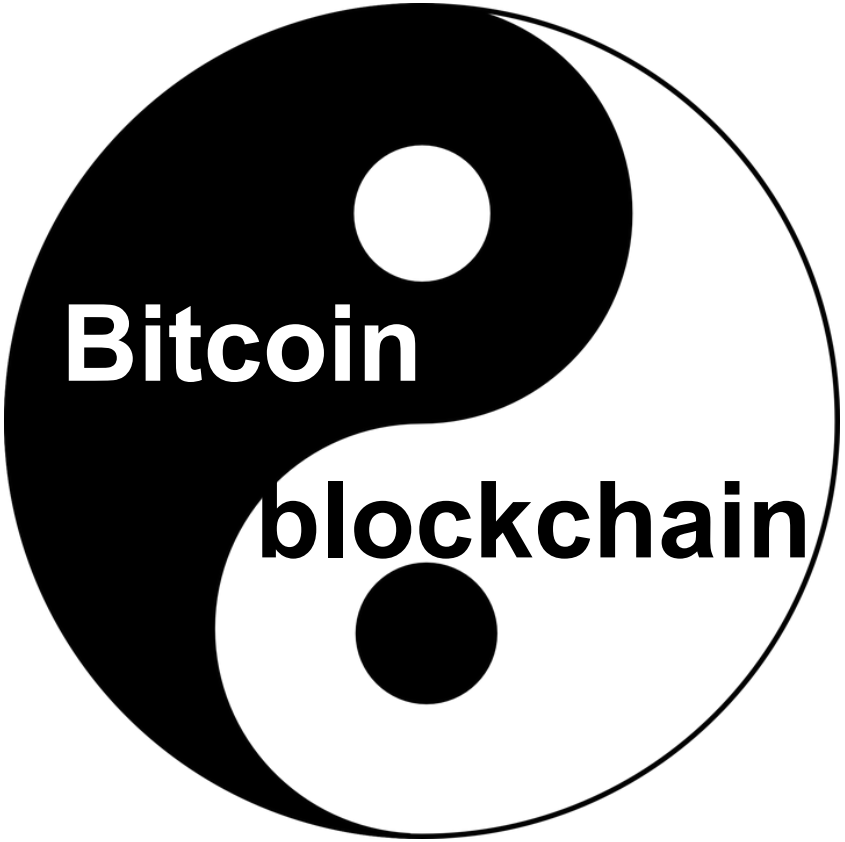
Why Bitcoin: Positively disruptive technology

Broad use cases all trying to provide best experience to the end user without fail.

“Be your own bank”

“Bank the unbankable”

Bitcoin and the blockchain



Popular questions

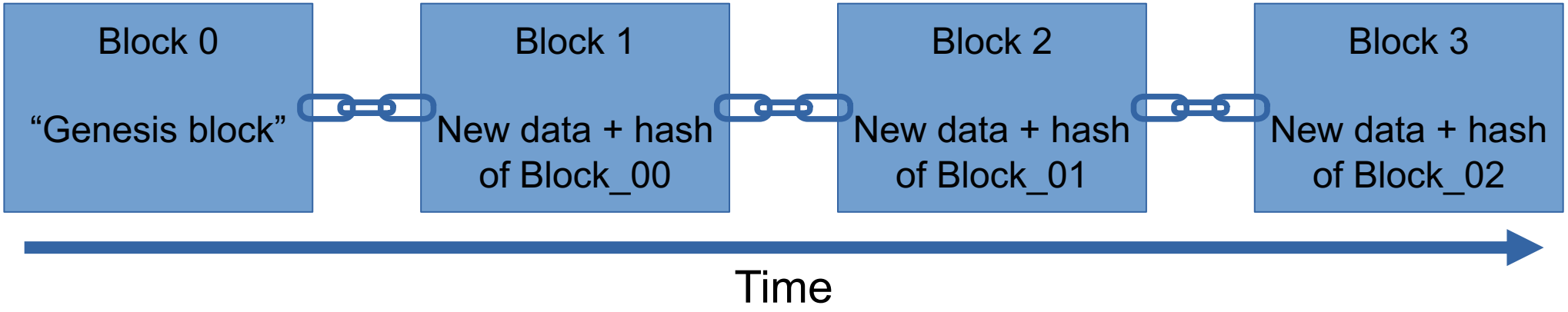
What is a blockchain?

What is mining?

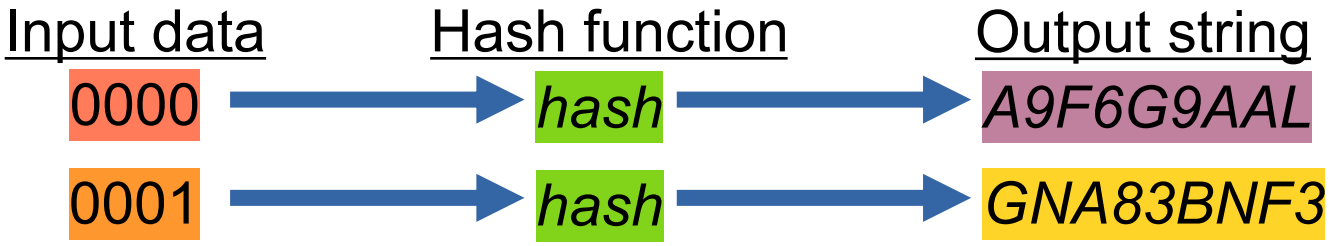
What gives Bitcoin value?

Who controls Bitcoin?

Popular questions: What is a blockchain?



Hash
Cryptographic function that generates a digital signature from input data.



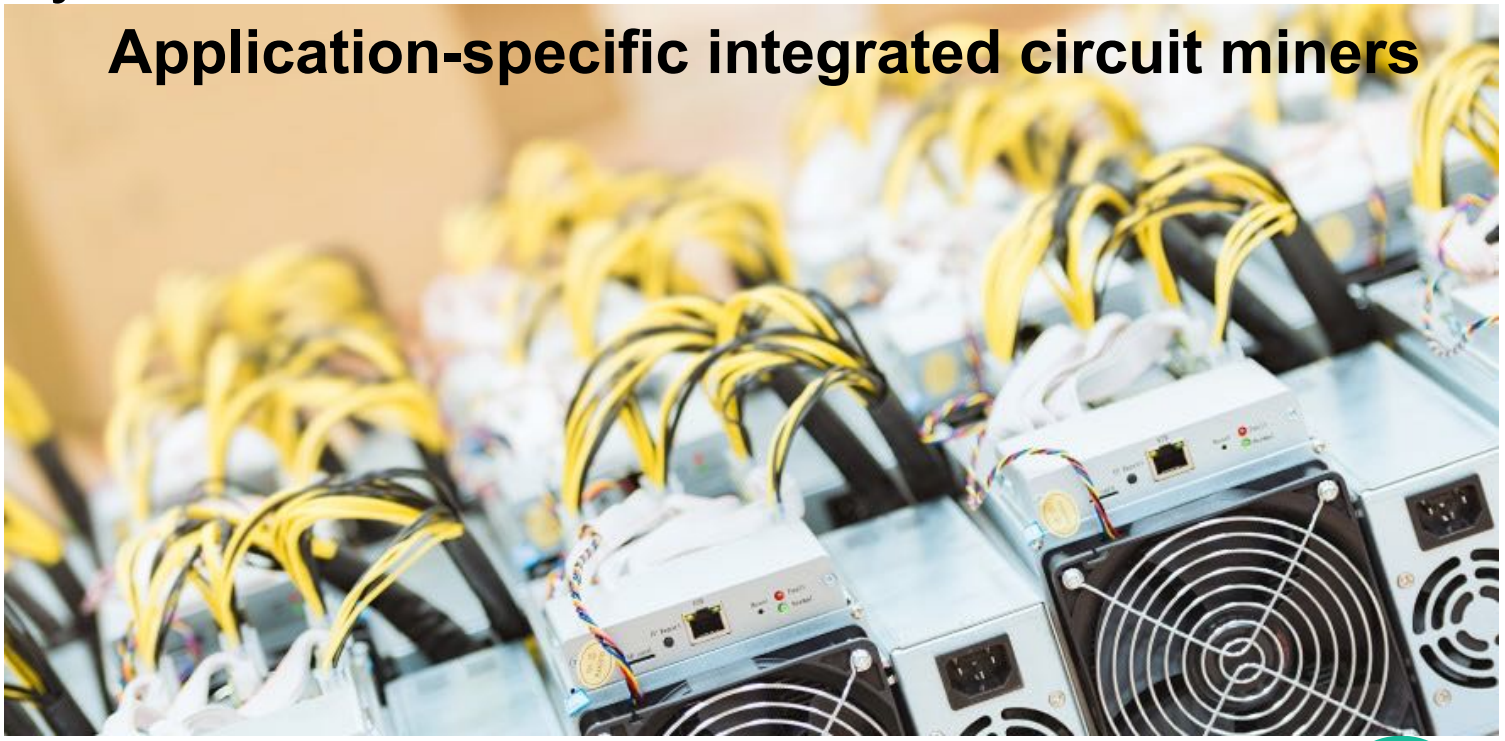
Popular questions: What is mining?

A global race every ~ 10 minutes.

Block 631031:
8.36 Bitcoin
($80,762)

https://mempool.space/

Application-specific integrated circuit miners



http://www.epe.admin.cam.ac.uk/cambridge-bitcoin-electricity-consumption-index-cbeci

Popular questions: What gives Bitcoin value?

Store of value

Transfer of value

Micropayments

Interoperability

Speculation

To be seen...

Popular questions: Who controls Bitcoin?

Short – nobody.

Long – the community

- Bitcoin holders
- miners
- software developers
- merchants
- embedded system designers
- …

Common topics

Power consumption

Speed and cost of transactions

Volatility and losing coins

I thought Bitcoin was dead?

Common topics: Power consumption

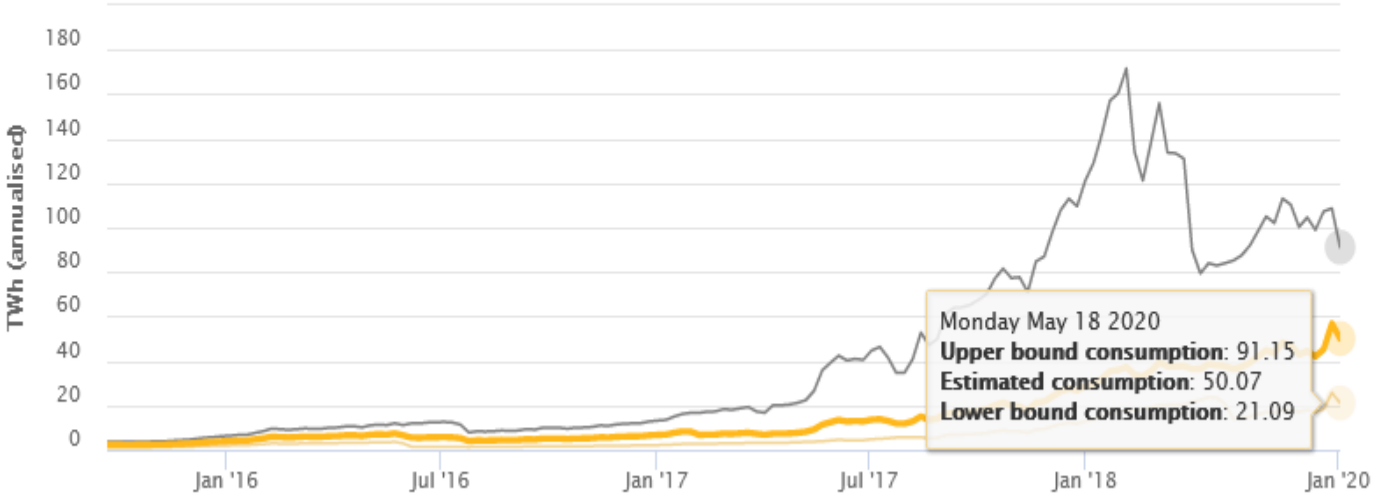
Bitcoin mining uses ~ 4.97 GW

Energy use is transparent

Up to 0.25% globally

Gold?

Is it worth it?



https://cbeci.org/

Common topics: Speed and cost of transactions

Bitcoin: 7 transactions per second
10,000 active nodes

Visa: 7000 transactions per second
119 data centres

https://cointelegraph.com/news/research-bitcoin-can-beat-visa-mastercard-to-top-world-payment-system-in-10-years

Common topics: Volatility and losing coins

More stable as time and use increases
Improved user experience and reduced risk

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Genesis block mined: 2009-01-09 02:54
https://blockchair.com/bitcoin/block/0

THE TIMES

Saturday January 3 2009 timesonline.co.uk No 69523 £1.50

Eat Out from £5

More than 900 great restaurants, including four Gordon Ramsay favourites from £15

Start collecting tokens today Pullout inside

Chancellor on brink of second bailout for banks

Billions may be needed as lending squeeze tightens

Salman Rushdie I won't marry again

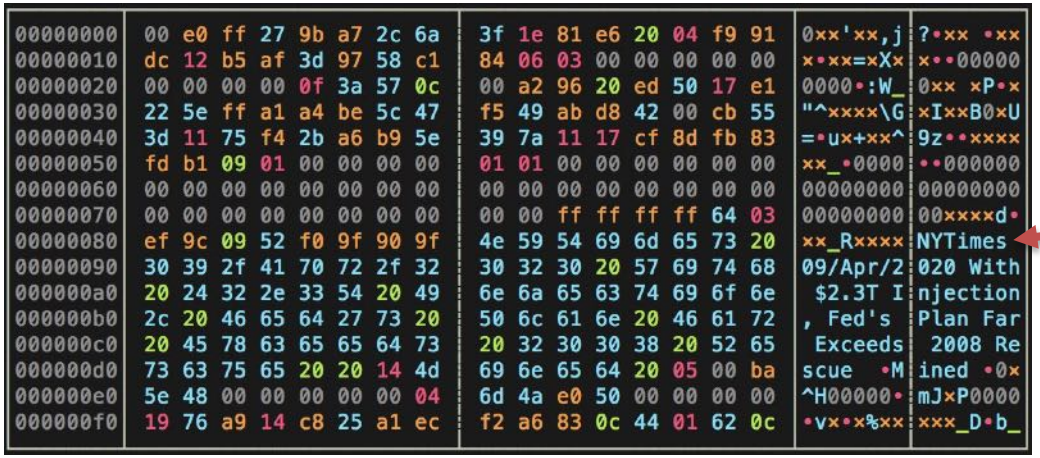
Giant killing? Guide to the FA Cup third round

99p

Common topics: I thought Bitcoin was dead?

380 times so far...

https://99bitcoins.com/bitcoin-obituaries/



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Block 629999: 2020-05-11 19:23

https://blockchair.com/bitcoin/block/629999

The New York Times

The Coronavirus Outbreak › | LIVE Latest Updates | Maps and Tracker | States Reopening | Living at Home | Newsletter

With $2.3 Trillion Injection, Fed's Plan Far Exceeds Its 2008 Rescue

The Federal Reserve said it would buy some municipal bonds and some riskier debt to help governments and companies.

https://www.nytimes.com

Building Services Engineering including HVAC&R/MEP

Construction accounts for ~7% working age population worldwide

$10 trillion spent on construction-related goods and services each year

Construction pre-tax margins average 1.5% down 4.1%
www.theconstructionindex.co.uk/news/view/construction-pre-tax-margins-average-15

$1.6 trillion dollars wasted – 2% global economy
https://www.mckinsey.com/industries/capital-projects-and-infrastructure/our-insights/reinventing-construction-through-a-productivity-revolution

20% of cost overruns are caused by inefficient project governance
https://www.pwc.com/gx/en/capital-projects-infrastructure/pdf/pwc-correcting-the-course-of-capital-projects-v3-pdf.pdf

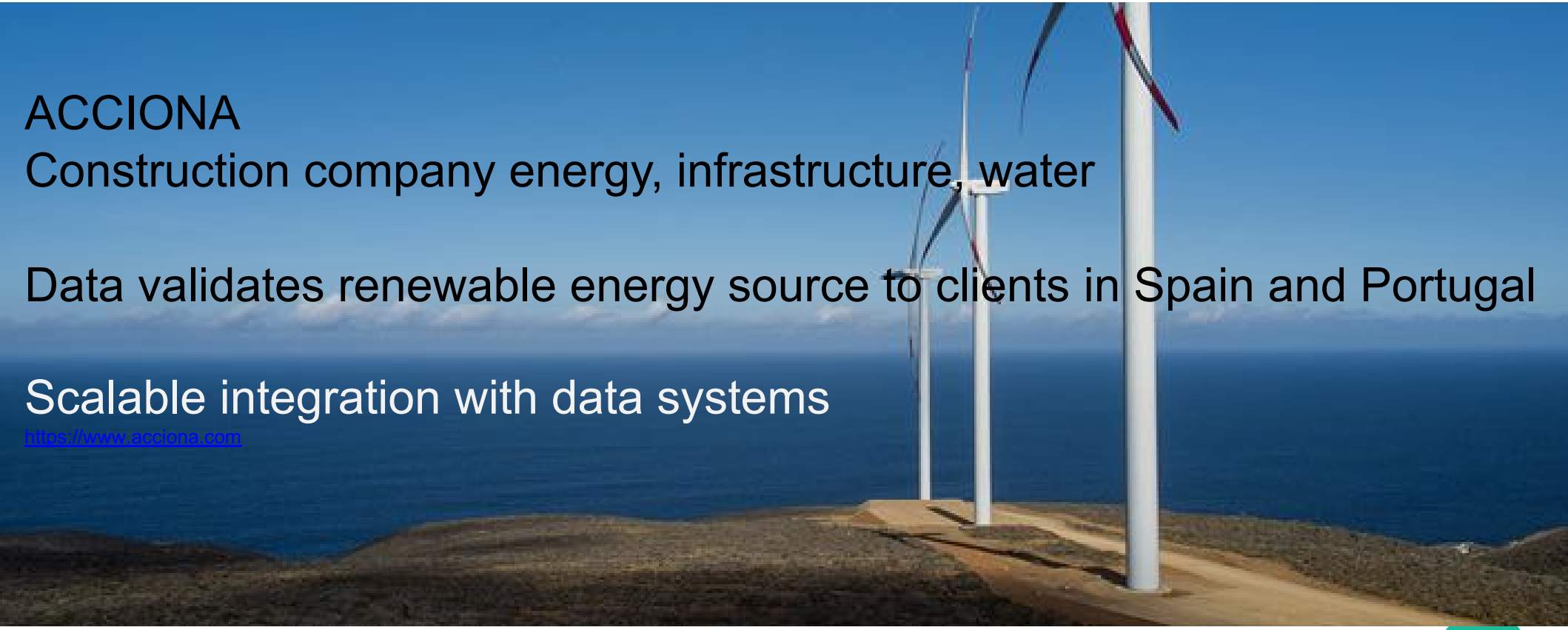
Blockchains in construction: Space-based land analysis

Hypervine co-funded by European Space Agency
Improving efficiency for extractive industries using space-based data
Provide data for topography, liquid, mineral and density readings
500,000 global extraction sites benefit from improved transparency
Carbon reduction achieved with operational efficiencies
Safety improved by eradicating lost paperwork or miss-recorded data

https://hypervine.io/

Image: ESA

Blockchains in construction: Real-time energy monitoring



ACCIONA
Construction company energy, infrastructure, water

Data validates renewable energy source to clients in Spain and Portugal

Scalable integration with data systems
https://www.acciona.com

Blockchains in construction: Real-estate

Skanska

Home sales in minutes

https://group.skanska.com/media/articles/new-listing-digital-home-buying-powered-by-blockchain/

Liisa Lintula December 11, 2018

Blockchains in construction: Land registry

ChromaWay

National land registry

https://chromaway.com/

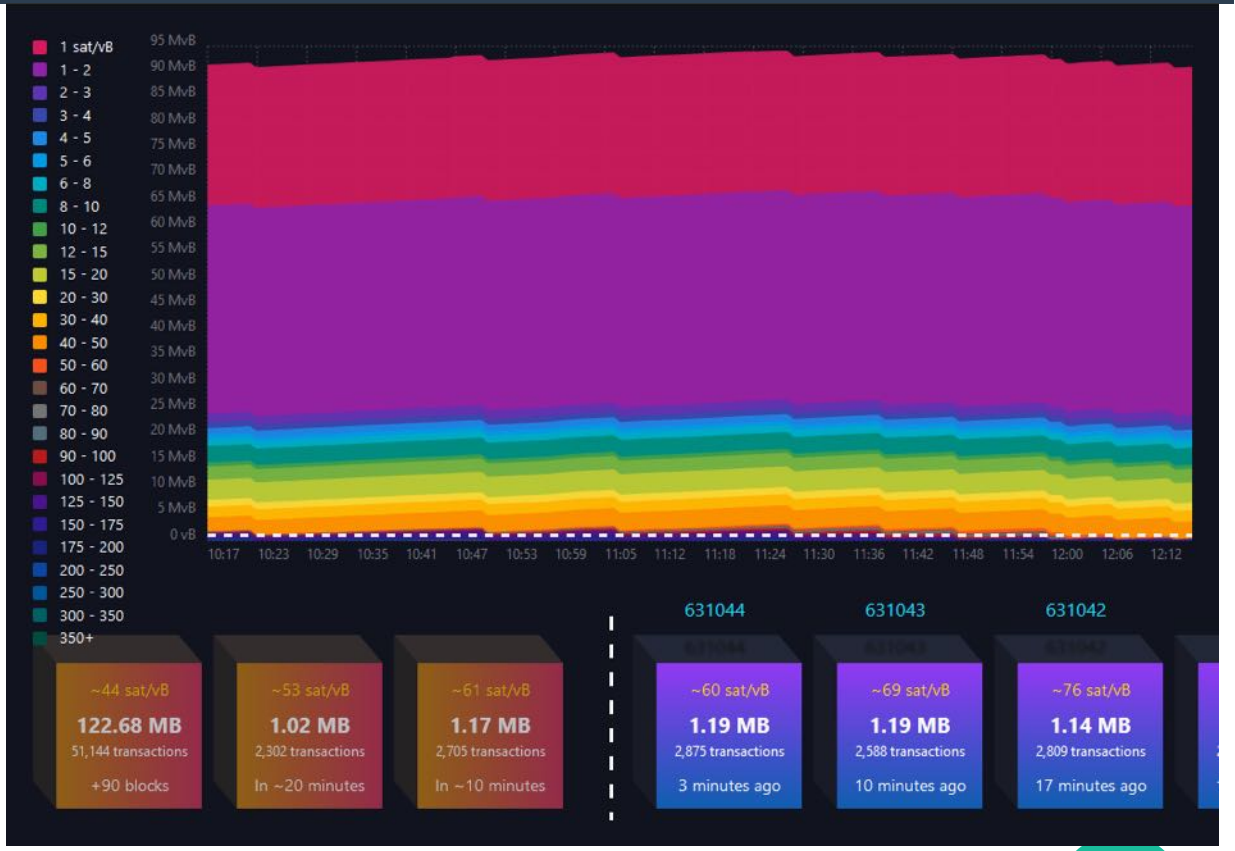
Recommended resources

The source:
https://www.bitcoin.org

Live transactions:
https://mempool.space/tv

High quality educational talks:
https://www.youtube.com/user/aantonop

Lots of network information:
https://www.blockchain.com/charts



My current contact details

My e-mail address:
tom@tomdwyer.uk

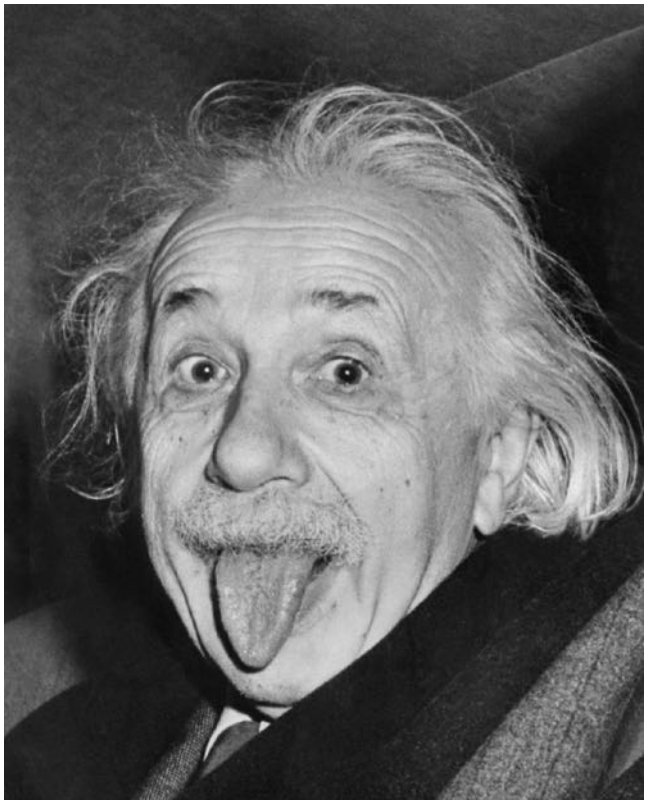
My blockchain employer:
https://extropy.io/

Final thoughts

“We cannot solve our problems with the same thinking we used when we created them.”

– Albert Einstein

Thank you for your attention.



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