



## THE COLD, HARD FACTS OF BITCOIN MINING

Soviet military bunkers in Kazakhstan and portable houses in Siberia linked up to the plumbing: Bitcoin mining is moving in some interesting directions that will become even more diverse as China cracks down on its domestic industry

Words and photos by: Chris Wright

**I**n a furniture store outside Irkutsk in eastern Siberia, an anarchist in jackboots and a Che Guevara hat is showing Euromoney a bitcoin mining rig hooked up to a bathroom boiler and expressing a hope that it might one day be used to evaporate human waste.

That is not the strangest scene in this article and certainly not the craziest idea – in fact it’s a very good one. But it is illustrative of some of the unusual directions taken by the young, entrepreneurial industry of bitcoin mining.

Mining is the process by which new bitcoin is created and through which transactions among existing bitcoin are recorded and verified on the public ledger known as the blockchain. Miners use microprocessors to solve complex mathematical problems, and the first to do so gets to place the next block on the blockchain, for which they are rewarded with newly released bitcoin.

In theory, anyone can be a miner. All you need is the right kind of processor, called an Asic (application-specific integrated circuit). If you have the most up-to-date equipment, then you can make money from mining, provided the revenue you generate is greater than the cost of the energy you consume in the process. Some consider it a far better model than investing in bitcoin itself.

Today China dominates bitcoin mining, responsible for as much as 70% worldwide. That is partly because China also leads the world in manufacturing the most efficient and cost-effective Asics. Three companies in particular dominate the field; Bitmain Technologies, Beijing-based producer of the AntMiner processors, is pre-eminent.

But China at a state level has become increasingly suspicious of bitcoin and last year began banning the many bitcoin exchanges that had sprung up in the country.

Earlier this year it moved on to bitcoin

miners too. This has taken a rather unclear form; provincial governments were told to: “Guide miners toward an orderly exit from the business”, as one source puts it, or “actively guide companies to exit the industry.” However, the outcome appears to be some bitcoin mining operations closing, a curb on new ones opening and others moving their operations overseas.

So, where is bitcoin mining going next?

THERE IS A SIMPLE EQUATION AT THE heart of bitcoin mining. To yield more revenue than you burn in electricity costs, you don’t just need the best processor you can find, you also need the cheapest electricity.

On top of that, you also need to consider the heat that your bitcoin mining rig is giving off. These two dynamics will inform your choice of location: ideally a cold place with cheap electricity.

In China, bitcoin mining operations in the coal-rich states of Shaanxi and Inner Mongolia moved quickly to those with plentiful hydroelectricity, principally Sichuan, where the Himalayas start their descent towards the lower and flatter land to China's east and the rivers feed numerous hydroelectric plants.

This is the heart of the modern bitcoin mining industry – or at least it was until the start of this year.

Were you able to get near them, at many hydro plants you might find an innocuous blue-roofed building built on the site of the power station itself, often with cables drawing power straight from the station rather than the national grid.

Within these humble buildings, often many miles from any form of public transportation, you would find two things: lines of microprocessors, cooled incessantly by dozens of fans, and basic dormitories where workers would stay for weeks at a time, working in the dark, getting through the boredom by reasoning that there is nothing to spend their wages on and that they are at least therefore saving money.

Since many of the power operators are themselves private-sector enterprises, the deals on electricity have been negotiated directly between power station and bitcoin miner. In cases where the plants have excess capacity that they cannot sell to the national grid, it has made sense to sell it at a discount to an on-site mining operation.

Generally the national grid takes from state-owned power stations before private-sector operators, so there has been a lot of capacity to sell. It has worked for both sides.

There are a number of companies, venture capitalists and entrepreneurs that have driven growth in Chinese bit-mining plants, some not even formally registered as businesses.

At the more formalized end have been companies such as HaoBTC, which runs (or at least ran) mines in both Sichuan and Xinjiang. Its former chief marketing officer, Eric Mu, gave the clearest picture of life inside these mines when he wrote an account for CoinDesk news site, including a recollection of a time an earthquake severed the only road connecting the power station in Tibetan Sichuan to the outside world and the workers had to eat potatoes for weeks

until they were rescued.

Then there are entrepreneurs like Ryan Xu, a Chinese-born Australian who worked as a reactor operator in a nuclear power plant before setting up bitcoin mines, including one in Kangding, Sichuan (others have apparently been set up in places including Iceland, the nation of Georgia and Washington State, as well as Inner Mongolia).

But the status of these operations is now uncertain. Xu is understood to have run at least three such plants, but bitcoin.com reported earlier this year that they had all been shut down; Euromoney was unable to



*“Policemen and other administrative personalities do not like my outlook. I live in the system, but I protest against the system”*

Dmitry Tolmachev

reach him for comment through companies he is known to be linked with. And HaoBTC's website in April carried only a message in Chinese saying that “due to the recent central government regulation,” they were not providing bitcoin transactions or client registration.

There is a lot of uncertainty about the state of mining in China now.

“I have not heard of a case where anybody has been ordered to shut down their mine or even had their miners confiscated,”

says Leonhard Weese, president of the Bitcoin Association of Hong Kong. He says, though, that many are moving their mines out of the country.

“I think the more relevant point is that bitcoin mining in China may have reached a point where it is consuming all the electricity below two or three US cents per kilowatt hour (kWh),” he says. “They can't grow anymore, and newly produced miners are deployed in Russia, Brazil, Canada, or anywhere with cheap electricity.”

THE COLD-PLUS-CHEAP ELECTRICITY equation yields its most remarkable outcome in a cave in Kazakhstan – a former Soviet military bunker, in fact, which now houses the bitcoin mining operations of Ice Rock Mining.

Stepped in dank Cold War tunnels near a village 100 kilometres outside Almaty, it is perhaps the perfect place for a bitcoin mine. It has a constant temperature of around 12 degrees Celsius, low enough to absorb the heat from the processors without any need for additional cooling.

It is owned outright by Ice Rock's chief executive, Malik Murzashev, (how he comes to own a Soviet military facility in a cave is a question we never quite get to ask him) and so there is no rent. And he says he has negotiated a long-term electricity supply of just 3c/kWh, on a par with the very best known rates, in Sichuan hydro plants. This is apparently because the mine is located in what is technically an agricultural territory and is therefore subsidized. (How long this subsidy will remain in place when the authorities realize he is not rearing sheep but mining bitcoin, is another question we don't get to ask him.)

Ice Rock Mining plans to have 5,000 Asics spread through seven tunnels in this facility and has conducted an initial coin offering linked to it.

Euromoney's communications with Ice Rock Mining start well and go steadily downhill. The company's executives, including Murzashev, are at first enthusiastic and invite us to visit the cave in Kazakhstan. Then the invitation is retracted, apparently on security grounds, to be replaced instead with a telephone or Skype interview. Shortly after that Amir Ness, a former equity trader who has been handling the group's

PR, leaves the firm. When Euromoney reaches him on the phone, he says that he is not comfortable that the right know-your-customer (KYC) processes have been established.

“They [Ice Rock] are not bad people, they’re doing everything they said they would do,” he says. “They’re just doing it in a way I don’t agree with, both in terms of the language on the website

He also expressed concern about apparent guarantees of returns on the website, which: “Put a number like 400% and come up with an answer that somehow seems to make sense but doesn’t.” He remains an investor in the project but no longer represents it.

Euromoney visits Almaty in March and makes a last attempt to contact Murzashev for an interview but in the

availability. It has the cheapest electricity in Russia, much of it sourced from a hydroelectric dam between nearby Lake Baikal and the Angara river that links it to the city.

Residents, as opposed to commercial businesses, pay around R1/kWh – less than two cents. And it is constantly cold. The average year-round temperature is zero Celsius; Baikal is frozen well into May.

Dromashko first heard about bitcoin over the radio in about 2011 and has regretted ever since that he didn’t jump right in. Instead he got started 18 months ago and now has two parts to his business: his own mining operation, using Chinese processors, and a farm that handles not just his own processors but those for other miners.

He is far from alone.

“My farm is not the biggest in Irkutsk, I should note,” he says. “Mining is really accessible to every circle of society here.” His farm consumes about 2 megawatts an hour, he says. “It’s a really profitable business. It’s amazing how fast it can bring money in.

“The situation for small-scale businesses in the Russian federation is not so positive,” he says, speaking from experience. “It’s very hard to do business in Russia now and very hard to gain rewards. But for mining, people are very happy. They have huge revenues: you can gain back all the money you have invested in a mining firm within three months.”

The most memorable people we meet in the whole industry are the interesting combination of a Che Guevara-styled furniture magnate called Dmitry Tolmachev – described earlier – and a computer-minded businessman called Ilya Frolov.

The two knew each other at school in Irkutsk but led different lives. Tolmachev, a self-styled anarchist but with a clear entrepreneurial zest, started out in business after the collapse of the Soviet Union, importing goods from Turkey, China and anywhere else he could find something the country needed. Then for 20 years he specialized in furniture production, still his



How a bitcoin processor is linked to the heating

and in having told me they were going to put KYC in place.”

He insists, however, that the mining operation is legitimate.

He then goes into more detail in a half-hour interview on YouTube published on March 19. “There wasn’t a strong focus on compliance, and I was OK with that in the beginning. But as things got bigger and bigger, I realized, no, we’ve got to have that in place,” he says.

He says things came to a head when he started speaking about the venture in the US, generating interest with investors there and bringing KYC and anti-money laundering (AML) standards to the foreground. “I saw that it wasn’t changing: that’s part of the management style, and I’m not going to be able to do anything about it.”

end is unable to reach him, nor to verify anything the company claims to be doing.

And so, to find the timezone’s new cutting edge in bitcoin mining, we must head further north – to Siberia.

**KAZAKHSTAN MIGHT HAVE A** location taken from a thriller movie, but for exotic characters there is only one place to be – Irkutsk, Siberia.

“We call it the crypto-capital of the Russian federation,” says Yuri Dromashko, who runs a bitcoin farm here having turned to the industry after running a bookkeeping office for more than 15 years and, at various stages, property investments and a karaoke bar.

Irkutsk is another example of the perfect confluence of climate and energy



Dmitry Tolmachev outside a house he designed to be heated by bitcoin computers.

main business. He has a multi-floor furniture showroom outside Irkutsk that is unremarkable except for the Che iconography all over it and the art gallery next door, where local artists can exhibit for free.

Frolov, meanwhile, worked for multinationals all over the world, from Coca-Cola to Caterpillar, involved in everything from the pump industry to Spanish olive oil. He spent three years in China working for Ikea before coming back to Irkutsk in 2013, where he set up a consultancy and really began to study bitcoin and blockchain technologies.

The two were brought together by a simple idea. Why not use the heat generated by bitcoin mining to warm homes? That way the heat emissions, considered a problem in most bitcoin mining, serve a purpose and further reduce costs. Why not connect the bitcoin rigs to a boiler (a crypto-boiler,

Tolmachev calls it) so that in addition to gaining revenue from mining, the heating bill is taken care of?

Tolmachev shows Euromoney a number of demonstration homes. They are small – some so small as to be portable – but well made, with room for bitcoin processors in areas such as bathroom cupboards, linked to a central heating system. “In our Siberian climate, we decided to use the heat for our houses, not to just waste it as a by-product,” he says.

In one modest 16 square metre room, the processor that heats it brings in about \$350 of revenue a month when bitcoin’s price is around the \$9,000 level (it was obviously a lot more when it was worth \$20,000 a coin).

“Normally you spend money when you have to heat your house,” he says. “In this case you spend no money, but you gain money.” The set up is linked to an app showing the progress of mining, revenue, electricity use and supply, strength of internet connection and so on.

Customers can buy a house with a processor or just the house and put their own processor in it. Some house models he shows us cost as little as \$5,000 to \$8,000. These are portable homes, which sounds strange, but is actually quite common in this part of Russia, where people will put a cabin on the back of a truck and transport it to the Baikal lakeside, one of the world’s most beautiful places.

The strong environmental agenda around the pristine Lake Baikal has led Tolmachev to some more far-sighted ideas for what one might do with bitcoin. Anyone who takes their house to Baikal is going to produce waste; Tolmachev thinks mining heat could be used to evaporate and ignite it.

“You can use bitcoin to sort out your excrement,” he says.

There is also the question what to do with the heat during the warm season, which most people in Irkutsk are at pains to point out barely even exists. “Our heating season [when heating is necessary] is nine months,” says Tolmachev. “In the summer, we can use [the heat] for greenhouses and swim-

ming pools.”

One of the reasons the model works and is gaining traction is because it enables the individual to take part in mining. Indeed, the lack of corporate standing is essential, since industry pays up to four times more for electricity than private citizens.

“There is a simple business model,” says Frolov. “You buy the home [and processor] yourself using your own money, and get the heat as a complement. You mine some bitcoins, which give you investment returns to pay the house and the equipment. We promote the idea that the house will pay the mortgage by itself: there’s no need to be a slave to the bank for 10 years, like I am right now.”

That individualist model will also help if Russia decides to crack down on bitcoin miners as China has done. A home is much harder for the state to intrude upon on than a big farm, says Frolov. He knows Dromashko and says he told him: “Don’t mine in one place, because you don’t know what will happen tomorrow. They can visit you and unplug you or whatever.

“But when you have private houses, it’s my business, I’m just using it to heat my house. This computer? It’s a heater.

“First they have to get into your house and to do that they have to find it, and they have to prove it is not a heater.”

Irkutsk’s quirky bitcoin mining industry attracts a confrontational, free-thinking, libertarian crowd. Tolmachev wears his attitudes on his sleeve in his Che hat, long hair and head-to-toe black clothing.

“Che was a person who didn’t want to have money but had everything,” he says. “He was not a Communist, he was a Marxist. His image helped me in Putin’s Russia.

“Policemen and other administrative personalities do not like my outlook,” he adds. “I live in the system, but I protest against the system. That is why Che Guevara said life is a fight.”

It really has been a fight. In 2011, people burned his shop to the ground. And last November he spent five days in jail after inviting Russian opposition

leader Alexey Navelny to his home.

So for someone like Tolmachev, the original libertarian ideals of bitcoin clearly strike a chord.

“I am like this too: an anarchist. All nations are the same,” he says.

Frolov is less of a revolutionary but a great believer in the possibilities of cryptocurrencies.

“I see the potential. I really like the people involved. I’m so excited by what I see, how the horizons are opening,” he says.

He is also practical: “I don’t know what the future of bitcoin mining is, but I know what the future of heating is. I’m 100% sure that the need for heating in Siberia will be for ever.”

Dromashko, too, is a big believer in bitcoin’s ideals.

“Bitcoin will take its place in the global economic system,” he says. “And if bitcoin has a future, then mining has a future too.

“The idea of a decentralized system is great. I’m a citizen and I do not like it when government or other authorities control my money transactions and try to limit my freedoms.”

NATURALLY, ALONGSIDE THIS individual opportunism is a more corporatized approach to bitcoin mining, and this finds its clearest expression outside the Asia-Pacific region, where Canada and Sweden are among the leaders.

Miner One, for example, is a crowdfunded cryptocurrency mining company that has set up its mining operations in Luleå, Sweden, close to the Arctic Circle.

Luleå is also home to the so-called Node Pole, a hub built specifically to support the cloud industry and data centres but also a natural home for bitcoin mining operations. Just like Irkutsk, it has a cold climate and plentiful green energy. Pranas Slusnys, chief executive of Miner One, tells Euromoney he is already seeing Chinese bitcoin mining companies setting up nearby.

Slusnys believes that bitcoin mining is getting a lot harder to make money from and is calculating that this will be to the advantage of professional operations like his as more players drop out.

There are clear arguments supporting his view that mining is becoming tougher.



*“I don’t know what the future of bitcoin mining is, but I know what the future of heating is. I’m 100% sure that the need for heating in Siberia will be for ever”*

Ilya Frolov, Baikalika

For a start, there are conditions hardwired into bitcoin that limit the number of tokens that can ever be mined - a maximum of just under 21 million, of which about 16.7 million are already in circulation. Additionally, roughly every four years, the rewards for bitcoin mining halve: where originally mining a block of bitcoin yielded 50 bitcoins, today it yields 12.5 bitcoins.

And the calculations required to mine bitcoins are getting steadily harder, increasing the level of energy consumption per coin gained.

This difficulty level adjusts itself according to the amount of computational power that is being employed, in order to keep the rate of new block discovery constant. It adjusts after every 2,016 blocks, which is roughly every two weeks.

“That all means you are getting less profit for the same equipment,” says Slusnys. “So we can expect that when the bitcoin price is decreasing and the difficulty is increasing, only the best mining operations from the most efficient operators will stay in the business.

“For the rest of them, it will no longer be profitable to stay in the business.”

A company like Miner One benefits from the fact that Sweden seems to be right on board with promoting itself as a centre, if not for bitcoin mining explicitly, then

certainly for data centres. This contrasts with China, which is clearly moving against bitcoin miners, and Russia, which operators fear may do so.

Slusnys says companies like his receive a discount on tax as a data-centre operation. Node Pole is not some out-of-nowhere hipster startup, but is owned by Sweden’s utility companies Vattenfall and Skellefteå Kraft.

Sweden is also quite happy to accept Chinese investment.

Magnus Wikman, chief executive of Node Pole, points to Chinese tech company Canaan Creative, which has set up in the Boden Business Park, part of a cluster.

Canaan’s chief executive NG Zhang says in a statement that: “We came to the conclusion that Boden is the best location for us to drive blockchain technology to the next level.”

“Sweden seems very open to bitcoin mining and in general is rolling out the red carpet,” says Slusnys. “Facebook is up there, Hydro66 [a data-centre provider]. I think Sweden is one of the leading countries in its support of data centres and of cryptocurrencies.”

That is probably true. But it doesn’t have the Soviet bunkers or the plumbing-rigged processors. Bitcoin mining, for the moment, has room for many different approaches. **EM**



# UP BIT OVER



# A bitcoin conference on a Thai beach, part of a cryptocurrency cruise, is quite a thing. Libertarian in outlook and cool in attendee, these are bitcoin's true believers. But as the price of bitcoin tumbled in January, why were they still partying like it's \$19,999?

By: Chris Wright



violinist is on stage trying to play along to 'Bitcoin Baron' by YTCracker, which is booming from a 15-foot-high bass-heavy sound system.

"I'm a bitcoin baron, I'm scaring the status quo/Got that crypto dough in that dat file to blow/And the algorithm gon' get 'em until prism," observes YTCracker, believed to be the first person in the history of music to try to get 'algorithm' to rhyme with anything.

It must be playing havoc with the interview a Thai television crew is trying to record with two American financiers, each dressed only in skin-tight Speedos and a lanyard apiece, but the cameraman is more worried about the delegate on a rope swing, who keeps soaring into shot in the background singing 'Delilah'.

In a dress code of board shorts and bikinis – a dress code Euromoney, who turned up in a suit, apparently failed to receive – 800 other delegates are wallowing in the Gulf of Thailand or lying on the massage beds on the shore, beakers of free sangria by their sides.

This is what the lunch break at a Thai bitcoin conference looks like.

"I think I'm overdressed," says a man preparing a Cayman Islands initial coin offering, naked from the waist up and leaning on a sign that reads: "Banana coin: world's first blockchain option for investing in production of organic bananas."

There are topknots on men and Bulgari Flora sunglasses on women.

World Bank annual meetings do not look like this.

"Let's get those bitcoin whales in their seats!" bellows the MC, wearing a 'Start mining now' T-shirt. "Crypto-revolute! Crypto-revolute! Crypto-revolute!"

And slowly the delegates drift back to

their seats, an unruly range of plastic chairs beneath umbrellas at the Paradise Beach Club Phuket, facing a stage more commonly used for riotous full-moon parties.

Most of the delegates are halfway through a four-day blockchain cruise from Singapore to Phuket and back, run by the blockchain services gateway CoinsBank. Since bitcoin absolutely tanked after the ship left Singapore two days earlier, its passengers have informally renamed it the 'Bitcoin Titanic'. But this is an inclusive, rambunctious, libertarian crowd, and one senses absolutely anyone would be welcome here bar JPMorgan chief executive and bitcoin denier-in-chief Jamie Dimon.

The MC bellowing about crypto-revolute turns out to be Eric Benz, managing director of bitcoin exchange and merchant processors Cryptopay, who sets a boisterous and celebratory tone despite the fact that everyone on the beach is, on paper, many thousands of dollars poorer than when they embarked upon the cruise.

"Everyone is a crypto friend to me," he says. "It's a special time in this industry. If you don't have bitcoin, buy some. Buy some now."

"At the end of the day, bitcoin is like the tallest tree in the forest: it's there for ever, it's not going anywhere," Benz says, showing a profound misunderstanding of forestry. "For anyone who hasn't gotten involved yet, it's not too late."

He hands over to John McAfee, another rock star of the industry, the anti-virus magnate who these days runs MGT Capital Investments, which among other things is heavily involved in bitcoin mining. McAfee is, by virtue of wearing long trousers and a loose blue shirt draped over a white T-shirt, by far the best-dressed person on the beach, barring Euromoney.

McAfee – a man who is so libertarian he once sought the US presidential nomination

for the Libertarian Party but lost for being too libertarian – is not one to worry about what he says.

In a 20-minute address he calls the US dollar a fraud, advocates the decriminalization of marijuana, says that 90% of cryptocurrency white papers are scams, casually notes that the Monero cryptocurrency is being used to sell everything from illegal drugs to monkeys, says he has assisted a collective of American prostitutes develop their own token system, savages Dimon, savages not only the US government but all governments, reveals that he employs hackers in Chicago, predicts the demise of banks and describes the bitcoin era as a "war against the established dynasty of power across the world".

"I spent two months evading an entire army in central America," he says in a low baritone, sounding and even looking a bit like Chuck Norris. "Do you think angry words are going to bother me?"

This is apparently true, part of a quite extraordinary back catalogue of life experiences. He was raided by the Gang Suppression Unit of the Belize police force in 2012 and later that year pursued as a person of interest in the murder of another American expatriate in Belize; the country's prime minister Dean Barrow called McAfee "extremely paranoid, even bonkers", around which time McAfee sought political asylum in Guatemala and was instead arrested and eventually deported to the US.

But we digress. The point of McAfee's speech is defiance: against market falls, against laws, against control, against the establishment: "Someone said governments are going to ban all cryptocurrencies. It's a great thing to say, but how? Tell me how you can create a law that will not be enforced? Bitcoin is permission-less."

THIS IS NOT A PLACE FOR THE NON-believer. There is little talk of the mainstream idea that bitcoin is built on nothing; nobody is talking about tulips here. Everyone on the beach is either a holder of bitcoin, a backer of cryptocurrencies or in some way already entrenched in the industry.

"I have not found a use for the US government," concludes McAfee, before giving way to Ronnie Moas, founder of

Standpoint Research. Not to be outdone by McAfee's rich CV, Moas reveals that in his youth, he put on concert productions for Guns'n'Roses and Metallica.

By turns boastful and furious, Moas devotes the majority of his speech to explaining how influential and prescient he is – “on July 3, I made headlines around the world” – and railing against income inequality, berating the crowd for what they spent on attending the conference and spelling out just how much could have been done with that money in aid to Haiti. An avid and active backer of humanitarian aid, he says he is “nauseated”.

Eventually he turns to bitcoin and his rationale that if 2% of increasingly overvalued assets in mainstream investments find their way into cryptocurrencies in the next few years, bitcoin should hit \$100,000 in three to five years, and possibly \$400,000 in seven to 10, by which time it would be the most valuable currency in the world.

“I don't know how much gold there is in the ground, but I know how much bitcoin there is,” he says, in a reversal of an analogy frequently used by non-believers (that they can see and feel gold and understand its use as a store of value but not bitcoin).

“But there's no guarantee bitcoin will stay at the top of the market. Remember what Amazon did, what Buster Douglas did to Mike Tyson, what Facebook did to MySpace. Champions get knocked out. There are no guarantees here.”

He explains how he has his bitcoin holdings spread across five exchanges out of concern that one of them will be hacked and could be wiped out – it seems at least a few people here remember the collapse of Mt Gox – and tells people never to trust texted codes to the phone as a method of two-factor authentication.

Like McAfee, he's certain 90% of white papers are scams. “It only costs \$100,000 to build a scam,” he says. “\$25,000 for a web site, \$25,000 for a white paper, \$25,000 paid under the table to a professor to sign off on it, \$25,000 for someone who will be the face of the company and who is comfortable lying to the public. Then they turn the switch on and have a few million in their pocket the next day.”

His view is that the best legitimate cryptocurrency pitches are impeded by the fact that their investors don't speak English as a first language.

Euromoney tries to get a question in about cryptocurrency as a method of financial inclusion but is beaten to the microphone by a half-naked Kazakh.

After lunch, Andrew ‘Flip’ Filipowski, chief executive of SilkRoad Equity, takes the stage. Filipowski has been involved in more business launches in this and other sectors than anyone, but it is best to point out that the other Silk Road, the online marketplace that was notoriously used for money laundering, drugs and even mooted assassinations, is not one of them. Having the name in common has provided a few nervous moments, though.

“I woke up one day finding out I had potentially been put in jail,” he recalls.

Intriguingly, he is the second over-65-year-old of the day to take the stage after McAfee, in contrast to the youth of most of the attending crowd. He tells us that he first wrote a computer program in 1967 and asks how many people can remember what everyone was told to invest in in ‘The Graduate’, to which the correct answer (plastics) is shouted out by precisely two people out of 800, one of them Euromoney. But there is not the disconnect of age one might expect; many of the crowd view these guys with enormous reverence.

Flip's is a presentation littered with other people's bon mots, and they fill a screen behind him from time to time: “The best way to predict the future is to invent it. The future is already here; it's just not very evenly distributed. 99.999% of humanity doesn't understand or appreciate the ramifications of what is coming. The past is a foreign country: they do things differently there.”

Age is no barrier to appreciation of the pace of change and he runs through everything from 3D printing to 5G and driverless cars, and how they might interact with the blockchain, with vision and passion.

Finally Euromoney ticks the box of lifetime ambitions marked ‘Shout out a financial services question while barefoot and open-shirted on a beach’ by asking Flip – who is a backer of Unocoin, an





Bitcoin on the beach: the dress code was relaxed, but the crypto-revolutionaries displayed the zeal of true believers in Thailand



India-based bitcoin exchange – to be the first person at this conference in Asia to say anything at all about Asia. Clearly a believer in the social justice that the early backers of bitcoin were so enthusiastic about, he posits that bitcoin could even bring India and Pakistan closer together.

Next up is Tone Vays, the blockchain consultant and researcher, who takes the stage to euphoric applause. Wearing shorts and a bright orange bandana, the first thing he does when he gets to the stage is to ask someone, anyone, to bring him some rum from the bar.

But Vays is the only one in the whole day to approach the bitcoin phenomenon with any sense of doubt or cynicism, or to reflect the concerns that mainstream finance has about it all.

He says the industry is making exactly the same mistakes as happened in the dot.com bubble in 2000, namely that anybody can buy into it without any particular assessment of its worth beyond the fact that they have heard about it and it seems to be going up.

With bitcoin it is worse, he says. “You no longer need to be a citizen of any country, never need to have a minimum age. There are people aged 13 trading Ethereum and bitcoin because nobody is stopping them.

“This was the biggest problem of the 1990s. Everyone thought they were a trader, that everything’s going to go up – and that means it’s going to come down.”

He bemoans the fact that, as in the late 1990s, founders of failed businesses are able to walk away rich. “You can cash out of your ICO instantly. Ethereum had eight co-founders. The minute they got the money, seven were gone.”

Ethereum, clearly, was a success, but his point is: “You have to stay and do what you promised.”

In a nod to the mainstream that doesn’t go down entirely well, he adds: “People hate traditional venture capitalists, but their job is to figure out if your business is any good and they are qualified to figure that out.”

He sees a bubble, expects it to burst and sees that as healthy – a view challenged by a belligerent Canadian from the (beach) floor who manages the mighty

feat of asking a question while simultaneously holding a drink, a cigarette and a microphone.

But Vays is a scholar of bitcoin and fundamentally a fan of its intentions and values.

“I got into bitcoin as a non-government controlled currency with a finite supply like gold,” he says. “I don’t want the government printing money.”

He bought into bitcoin when Cyprus decided to shut down its banks and take more than 40% of people’s deposits over €100,000 in March 2013. To him, it expressed everything that was wrong about the existing financial system.

Vays has by now been brought so many rums, he is enlisting help to drink them (Benz steps in), despite his uncharacteristically duff note to this tribe of believers.

“I really thought people were a lot smarter 20 years after dot.com, but I grossly overestimated that,” he says.

Last up is the fifth successive American at this Asia conference, Malcolm Wilkinson from Healthureum, whose earnest efforts to explain the way healthcare and the blockchain can work together are somewhat undermined by an announcement that everyone needs to start heading back to the ship. Instead, by and large, they head to the bar and the sea, ignoring the exhortations of valiant young Russian conference organizer Kristina for everyone to get back on the damned boat. But finally they are gone, ready for a full day of presentations on the boat back to Singapore the next day while absolutely pounding the onboard WiFi to see how much money they have lost that day.

Euromoney hitches a lift on the back of a truck back to a local hotel to reflect.

Three things are clear: that there is a constituency of unshakable belief in cryptocurrencies and blockchain so strong that it is likely to thrive no matter what the rest of the financial world says. That the libertarian ethos that came with bitcoin’s foundation before it became a vehicle of absurd speculation is still intact, at least on the speaker circuit. And that bitcoin aficionados know how to have fun at a conference.

Next time Euromoney is turning up in budgie smugglers. **EM**

# CRYPT-TOKYO RIFT



# The Coincheck cryptocurrency fraud has rocked Japan, the first country in the world to build a regulatory environment for crypto exchanges. The FSA regulator tells Euromoney how it built its rules, while investors question if they are fit for purpose

By: Chris Wright Illustration: Pride of Lines

**P**ity Japan. The country has sought to build the most sophisticated and inclusive regulatory environment in the world for cryptocurrency exchanges, one that marries supervision with a need to foster innovation.

Yet it has now been home to the two biggest heists in cryptocurrency history. Bad luck? Or has one state of affairs led to the other?

The theft of at least \$500 million-equivalent of cryptocurrency from Tokyo-based exchange Coincheck in January has left the Financial Services Agency (FSA) reeling. It is simultaneously trying to work out what happened, stop it from happening again and decide whether or not its regulatory approach is flawed.

The FSA has not spoken publicly about the heist, but two sources at the regulator briefed Euromoney at length at its Kasumigaseki headquarters in February, on condition of anonymity.

To understand the Coincheck situation one must first go back to the earlier theft, from another Shibuya-based exchange, Mt Gox. That involved a similar volume of cryptocurrency (\$450 million, based on the value at the time) when 850,000 bitcoins were stolen in early 2014, 650,000 of which remain unaccounted for today.

Blind-sided by the theft, Japan immediately set about creating an environment that would protect investors without driving out a growing sector at a time when Japan needed growth.

“There was a sense of ‘we’ve been left behind in fintech, and if we want growth, we have to stop being so protectionist,’” observes one banker in Tokyo. “The regulatory approach they developed for cryptocurrencies was caught up in that sentiment.”

The FSA tells Euromoney that Mt Gox was only one reason for developing the new

standards and not the most important.

“The first perspective was anti-money laundering,” one source says, speaking to Euromoney through an interpreter. At the G7 summit in 2015, a discussion had taken place about the transparency of currencies, including cryptocurrencies. “There was an international requirement to take action against money laundering. Setting up a registration or licence system for cryptocurrencies was the first step.”

A document from the time shows that the measures had two principal goals: ensuring the trust of users – through the revised Payment Services Act – and money-laundering/terrorism financing countermeasures, through the revised Act on Prevention of Transfer of Criminal Proceeds.

The regulations came into effect in April 2017 and were considered accommodative. They set various requirements for identity verification, the reporting of suspicious transactions, safety management and separation between cash and virtual currencies, but they did not carry exacting capital requirements.

And they perhaps brought about an unintended secondary effect: they seemed to legitimize cryptocurrencies.

“The problem was that by agreeing to regulate and license cryptocurrency exchanges, the FSA gave the whole sector a stamp of approval in the eyes of investors,” says another banker. “There was a sense of ‘if the FSA is regulating them, they must be OK.’” Is this fair?

The FSA says not.

“This regulation system is not for cryptocurrencies themselves,” says a source. “This is a regulation imposed on cryptocurrency exchanges. So it’s not the case that we made sure that cryptocurrencies would be safe under this regulation, or that the Japanese government endorses cryptocurrencies.

“That’s not the case at all. This is just a regulation imposed on the exchanges so

that they can take appropriate measures for money laundering and protection of users.”

A decision that has attracted particular scrutiny was the one allowing existing exchanges to continue even when they were not yet licensed. Many, after all, pre-dated the new rules.

“With the enactment of the regulations, every operator has to have a registration with the FSA,” says a source at the regulator. “But there are several operators and exchanges which already conducted businesses even before the introduction of the law. If we tried to stop them from operating, that would cause a lot of problems, for consumers as well.

“With that consideration in mind, we decided to take a transitional period.”

Under the terms of this transition, operators that were already up and running would be called ‘deemed registered operators’, pending formal licensing.

“However, for those deemed operators, we impose the same regulations and rules for the licensed or registered exchanges, so we believe there is a certain appropriate level of supervision of these operators as well.”

## AFTER THE INTRODUCTION OF

Japan’s rules in April, exchanges were given six months to register; Coincheck, which had been established in August 2012, was one of them, filing its application in September 2017.

By that stage, it was one of the biggest exchanges in the country and therefore the world, with 71 staff, operating, like most exchanges – and Mt Gox before it – from the tech-heavy Tokyo suburb of Shibuya.

Also like most exchanges, it was a touch belligerent towards the very idea of regulation. Its business development manager, Kaga Kawabata, gave an interview to Reuters last year, saying of the FSA: “They have no knowledge. Every year someone moves and it’s a big pain to educate them.”

In its first attempt to be licensed, Coincheck failed, apparently because of weaknesses in the exchange’s systems, although it has not been more specific about what those weaknesses were. The FSA called for improvements, but, in the meantime, did not stop it from doing business.

Then things went wrong.

Around 3am local time on January 26, a hack took place on the Coincheck exchange. Some 523 million NEM coins, worth just

over a dollar each at the time, were transferred off Coincheck's servers after the theft of a private key. The hack affected 260,000 investors.

By 5.25am, Coincheck had suspended deposits and withdrawals, and reported the theft to the police and the FSA. The FSA, in turn, ordered Coincheck to make a report to the FSA, "including the statement of the facts and the cause of the incident and what kind of measures they are taking to prevent this incident being expanded, and its impact on their financials", another source at the FSA tells Euromoney.

The FSA says it received this report two days late, "but the content of the report was not sufficient. So, on the following day, we gave a business improvement order to Coincheck."

This order, the source says, again asked Coincheck to report the cause of the incident, explain the management system and its responsibilities, and explain the establishment of a risk-management system.

The deadline for this was February 13, two weeks later, by which time a number of other things had happened.

Coincheck had promised to refund everyone affected by the scam; the NEM development team, the engineers behind the specific cryptocurrency that was stolen, had ruled out a so-called hard fork, a change to the underlying blockchain protocol that would make previously invalid transactions valid; they had also tagged all the stolen coins, effectively rendering them impossible to use or resell without detection; and the FSA had made a site visit on February 2.

Euromoney's visit to the FSA took place shortly after the February 13 deadline.

"We are still in the process of checking all those requests we asked them in the business improvement order," the source says. "We are now discussing with Coincheck what is the real cause, the root cause of the problem? Is it because of a failure of the system, or their lack of an appropriate risk-management system, or that their management people didn't have enough understanding of the risk? We are still discussing with them."

IN THE MEANTIME, THE FSA HAS ordered all 16 licensed cryptocurrency exchanges, and 15 deemed exchanges – such

as Coincheck – to make "an emergency self-assessment of their own system" and to report back. Those reports have been received and are being analyzed, accompanied by on-site inspections to several exchanges.

"We are going to verify their risk-management systems," the source says, while also deciding if any further measures are required.

Consequently, the FSA will not be drawn on anything it is going to change, pending the results of these queries and inspections, but one change that is likely to take place concerns the storage of assets.

There is a crucial distinction between what are known as hot wallets and cold wallets.

Hot wallets involve the storage of cryptocurrency assets in a digital folder on a server. A cold wallet stores the assets in a way that is not connected to the internet, such as a USB drive. It is considered best practice to store assets in cold wallets, but the stolen assets in the Coincheck case were in hot wallets.

The FSA will not say if the rules around storage of digital assets will be changed, saying they are still analyzing the responses from exchanges, but this would be an obvious step forward.

A MORE FUNDAMENTAL ISSUE, however, is how one regulates cryptocurrency exchanges at all and even if one should do so. How does a nation regulate something that is inherently borderless? If one is to insist on risk management, what precisely are the risks to be managed? What are the parameters and how does one assess compliance with them?

"Each exchange has a different business model," says a source at the FSA. "The scale and the characteristics differ. We are conducting hearings with those companies, the people in charge, so we can identify the particular risks they are exposed to and monitor those risks."

"Some exchanges deal with a great number of currencies and some with a small number. Based on the risk characteristics of the exchanges, we are trying to come up with appropriate measures for all exchanges."

Asked for examples of reasons the FSA might not approve an exchange, the source cites measures to deal with cyber-security, the strength of the system to confirm identity and whether or not there are appropriately segregated account systems.

The source says there is no specific time frame for coming up with its conclusions.

At the heart of it all, however, is a problem of being first. Many other regulatory bodies are believed to have been in touch with the FSA as they try to work out their own responses to an extremely challenging field.

As Euromoney reported in February, responses have been varied.

Japan has sought to regulate and foster; China has banned; Korea seems to be wavering between banning and regulating; India says it is going to ban but still might regulate; and both Hong Kong and Singapore take the view that they will ignore the whole field – seeking to avoid giving legitimacy to something that might be used for money laundering – except where cryptocurrencies show the characteristics of securities, in which case they will be treated like every other security.

BEING FIRST MAKES JAPAN'S regulatory environment for cryptocurrencies the most sophisticated in the world by definition, simply because it exists at all. And many admire it.

"Japan is progressive," says Navin Gupta, managing director for India at Ripple. "Of course it has had many ups and downs, but the regulator has always been clear. It is one market that stands out."

However, that does not mean it is watertight.

"In my view, it isn't sophisticated at all," counters one banker in Tokyo. "The problem is people assume that it is."

So the FSA is grappling with an industry that it cannot ignore, but that it is still trying to understand.

"Our principle, as finance minister [Taro] Aso said, is that we have to make a very good balance between the promotion of innovation and protection of users," says a source at the FSA.

"We recognize that because this business is advancing quite rapidly, it is critical to have good and close communication with industry organizations so we can come up with the appropriate environment."

The problem for Japan, as it has now learned twice in four years, is that it is trying to come up with a dependable environment for an industry that is already vibrant to the point of recklessness.