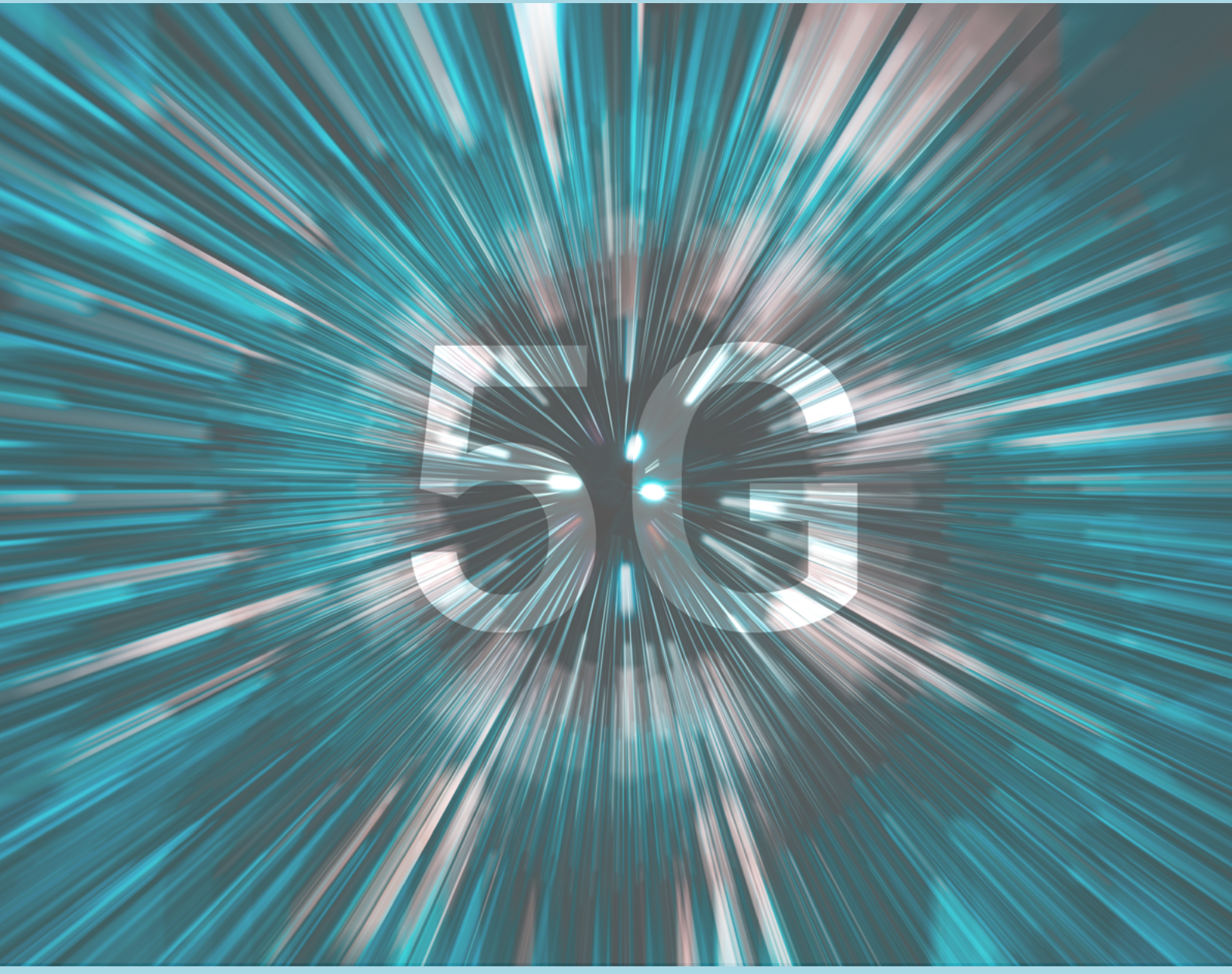
FRONTIER TECH INVESTOR

The Genesis Chip:

The tiny project driving the 946,000% 5G boom



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The Genesis Chip: the project driving the 946,000% boom

You've read about it for years.

You've heard the big build up over and over.

Depending on where you live you may even have started to see 5G boxes and towers pop up in your area.

Now is the moment of lift-off for a tech upgrade from which a tantalizing number of new industries and opportunities shall cascade.

In this issue, I'll run you through the most important new developments… how 5G could grow 60-fold in the next 12 months… and share my NEW recommendation to help you take advantage of what's happening…

The small project providing the technology that drives 'the genesis chip'.
It's a way to get exposure to the technology network that could end up connecting every 5G device on earth together.

The big news recently is that – after months of wrangling and debate about Huawei's involvement on the UKs 5G infrastructure…

It looks as if the government is now making a concerted effort to distance itself from China.

As reported in *The Times (29 May 2020):*

Downing Street plans new 5G club of democracies

Britain is seeking to forge an alliance of ten democracies to create alternative suppliers of 5G equipment and other technologies to avoid relying on China. New concerns about Huawei, the Chinese telecoms giant, have increased the urgency of the plan after security officials began a review into its involvement in the mobile network upgrade.

The government has approached Washington about a "D10" club of democratic partners, based on the G7 plus Australia, South Korea and India.

One option would see the club channel investment to technology companies based within its member states. Nokia and Ericsson are the only European suppliers of 5G infrastructure and experts say that they cannot provide 5G kit as quickly or as cheaply as Huawei.

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A Whitehall source said: "We need new entrants to the market. That was the reason we ended up having to go along with Huawei at the time."

Britain has maintained that three suppliers are essential in 5G infrastructure, which meant Huawei, Nokia and Ericsson won approval. Britain has labelled a Huawei a "high-risk" vendor, however. When Boris Johnson approved its involvement in 5G early this year, he set a 35 per cent market cap and banned its participation in the sensitive "core" of the network.

The review into Huawei, launched last week by the National Cyber Security Centre, followed the announcement of US sanctions to block the sale of American chips to the company. UK security officials fear that the ban will prompt China to use cheaper, less secure technologies, instead of verified US versions. Officials are examining proposals to curb the installation of Huawei kit in the 5G network from 2023. Ministers believe, however, that it would take longer to remove the company's existing equipment.

This is an interesting development and one that shows you just how critical this new technology is… and the high level at which its future is being shaped.

But let's set aside for the moment the fixation with which company is going to supply the network equipment to finish building out the UK's network. To some extent that is a bit of a distraction. It's newsworthy, for certain. But I am not here to report the news. Because there are ways to position your money strategically now, in the 5G revolution, that could really pay off in the years ahead.

So let's instead focus on the fact 5G services are already in the market. EE was the first to launch its service in a limited number of cities in May 2019. It has plans to add considerably more cities over the next year.

Vodafone launched in June 2019 and has clearly stated it will be providing Huawei routers to domestic customers throughout its network. 3 UK launched in August.

BT launched its 5G network in October and, at least for the moment is relying on EE's network. O2 also launched in October.

The issue of *Frontier Tech Investor* focusing on 5G was published in November 2019. (Click here to view it.) But now looks to be a time of even greater opportunity. If you're an investor with some risk capital – you could see a tremendous reward if this takes off as I expect.

How 5G goes 60X

Our earlier play on 5G, Cisco Systems (which we sold for an 18% profit this year), is also active in the UK and signed a deal last year with the UK government to test a rural 5G network. One of the projects it is active on is in providing a network for the BBC to run radio over in its RuralFirst scheme.

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Let's think for a moment what the scale of the rollout from a small number of nodes to a nationwide network will mean for phone sales in 2020. I haven't found new figures yet but last year, Deloitte estimated that UK vendors would sell 50,000 5G handsets in 2019 but that is expected to grow to 3 million in 2020. That's an increase of 60 times the current market within 12 months. Barclays estimates the UK will be £15.7 billion better off by 2025 as a result of 5G.

All of this tells us that regardless of the politics, 5G networks are on the cusp of their full rollout this year. Even more importantly, this is a global phenomenon. Commercial rollout has already begun in South Korea, Spain, the UK, Switzerland and the USA.

Samsung alone sold 6.7 million 5G ready handsets in 2019.

China, however, was the first large country to switch on a nationwide 5G network at the beginning of November 2019. By 2025 China's 5G market will be larger than the USA and Europe combined. They estimate 110 million users in 2020. Prices are beginning at about the same level as South Korea and while that is cheaper than the price of 4G in China it is still rather pricey considering the per-capita incomes are so much lower.

Deloitte also had this to say about the global rollout of handset sales:

"At the end of 2020, we expect 5G handset sales (15-20 million units) to represent approximately 1 percent of all smartphone sales, with sale taking off in 2021, the first year in which all retailers will sell more than 100 million 5G handsets."

Right now, Samsung and a number of Chinese manufacturers like Huawei, Oppo and OnePlus are the primary suppliers of 5G handsets in the UK. Apple expects to have a 5G-ready handset in the market – expected to arrive in late 2020. But as we know, 5G is about much more than mobile handsets.

The tech boom 'holy trinity'

Big, life changing, bull markets thrive on three primary technologies all delivering step changes in growth at the same time. These are the energy/transportation, communication and finance sectors. All of these are likely to be deeply affected by the roll out of 5G. That's why it is such an enabling technology. Its existence enables so many more bull market stories to take shape in sectors that will be positively affected by the rollout.

I think of this technological evolution like this: The first phase of the digital revolution was to take the objects we interacted with and transform them into digital products. The second phase will be to take the physical services I engage with and turn them into digital products. This is a process that is already well underway. I used to have to go to a travel agency, now I can book everything online.

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However, that process of displacing middlemen is about to get a massive boost from 5G. The legal and medical sectors in particular are in line for significant disruption. These protected sectors have been immune to technological disruption for a long time but the reality is much of what doctors and lawyers do is to collect a fee for filling out a form. The digital world is changing that and the introduction of augmented reality means there will be less and less need to visit a GP or solicitor.

That's how we will experience 5G on a personal level, but perhaps the biggest disruption will be in how companies will interact with quick mobile networks to greatly increase the scale of their cloud services. Today, many people can work remotely because they have access to databases via broadband that allow them to manipulate, record and share data without ever setting foot inside the company's HQ.

The heavy lifting in terms of calculation takes place on the server but we can access the full range of what it can achieve remotely. With 5G the range of what is going to be possible to achieve through a distributed network will balloon. Cloud services currently allow us to access our email and apps from our phone. However, the advent of 5G will put super computers and soon enough, quantum computers, at our fingertips. These are services that are currently only really available to academics and data-driven companies. The range of questions people have been able to ask via the web has been limited, by access to computing availability, as well as the ability of services to deal with the quantity of data available.

We are the same stage today as before the introduction of the personal computer. At the time many experts couldn't understand how anyone would want to have a computer in their homes. The same is true today of supercomputers and predicative algorithms.

However, what if it could tell a new mother when her child was going to get sick and what to do about it? What if the sensors in my home could monitor for signs of depression or substance abuse and help parents intervene early to help their teenagers? How about helping a young person better understand what they need to do to fit into their first job? How about a tailored assistant that coaches and prods us along in furthering our career goals? How about a marriage counselor, that advises you when it's time to play nice? How about a personalized medical assistant to let you know which foods to avoid based on your individual genetic profile?

The computing power for these kinds of services exists today but individuals do not have access to it. It is incredibly cost prohibitive to run that kind of service from one's home but ultrafast reliable connectivity will bring access to these kinds of services within our grasp. You might not even want any, or all, of them. However, we need 5G to offer the connection speeds for these kinds of services to function seamlessly.

Every company, no matter the size, wants to know how to reach more customers, how to provide them with the best possible service, how to boost engagement with products, how to anticipate problems before the they arise and how to develop new products that meet unidentified needs. The promise of 5G is not only in the availability of services but in the quantity of data that will be delivered about every consumer, business and the built environment.

This is even more important for companies with significant pieces of physical property. For example, it is much better to know a major piece of machinery is under stress before it breaks down rather than after. That is most particularly true of the airline industry where planes fly millions of miles over the course of an in-service lifetime and safety is at a premium.

In the oil sector, having internet connected wells with highly sensitive sensors means real time action on pressure, gas mixes, fluids, heat and metal strain can all be monitored remotely which would greatly expand on the ability to monitor operations intelligently. 5G will completely alter how data is delivered and will overlay a digital lattice on the physical world. The build out of the network will enable the placement of trillions of sensors in every possible location. That will enhance the ability to interact with physical objects. It will also, through the provision of data, create an environment where we can interact with an enhanced digital replica of the world via augmented reality. The introduction of data driven analytics and deep learning creates a fractal experience where the depth of knowledge about any particular part, place or function can be drilled into to deliver information and insights.

At the other extreme, one of the services we use every day but never think about is traffic lights. They are the ultimate in silent authoritarianism. We are all conditioned to understand green means go and red means stop, with a little wiggle room on either end. However, they are just a piece of machinery we built to make traffic flow easier. It's hard to imagine that 5G will alter how they function but with more connectivity. Cars will be able to communicate with one another and with the built environment.

That's not something that relies on autonomy, the only thing holding it back is access to enough bandwidth to handle the data. That's a new idea, the ideal of the green wave, where every light turns green just as you approach it has been talked about for decades. It has always been considered to be too technically difficult to achieve but the advance in sensors, connectivity and deep learning make this kind of technological leap possible because they can all interact over 5G.

Here is one of the greatest ironies. There have been experiments with green waves in a number of European cities such as Amsterdam and Copenhagen for bicycle traffic but officials have been less enthused by applying this to cars. In the UK any real exploration of a green wave was been previously curtailed by government because it would reduce fuel consumption and therefore taxation. With increasing concentration on emissions that view is starting to change. One thing is for certain. 5G will birth a host of new industries. And with those new

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industries, billions more devices connecting to the internet.

A study by IHS Markit forecasts new 20.3 billion devices coming online in 2020, rising to 50 billion by 2030.

For perspective, as I write, there are approximately 5 billion devices connected to the internet.

Now, the vast majority of those interact with humans – known as the Internet of People. But this new crop of devices will interact with each other. And it has come to be known as the Internet of Things.

This is where the 'Genesis Chip' comes in…

Introducing your first recommendation to play the 5G boom: The pioneering network that powers 'the genesis chip' – IOTA

Let's turn our attention to cryptocurrency networks. I said earlier that 5G is an enabling technology that is going to enable exponential growth in energy/ transportation, communication and finance. The transportation sector can be altered by relatively modest changes like the green wave or by deploying full autonomy for all vehicles which is obviously much more ambitious. Communications are central to 5G but it is in finance where some of the most profound changes can take place.

The evolution of technology enhances the productive capacity of underserved portions of society. Whether that is by providing more free time because of labour saving devices, electric light to read by various methods of spreading news and strengthening the flow of information. That has allowed for the end of slavery, the ongoing work to achieve equality of the sexes and greater acceptance of minorities.

In other words, technology's long-term effect is to democratize opportunity for creative outlets.

That's also the central promise of blockchain and tangle network technologies and the cryptocurrencies that enable the security and continuation of these networks.

The sector has the potential to unleash massive global productivity enhancements. The technology bull market that is now underway is focused on Wall Street and Silicon Valley but for the first time the scope for the investment opportunity is truly global in nature. That's why so many people are excited about cryptocurrencies which is why when we look at all technology trends together this is likely to be the biggest bull market in history.

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On the crypto front, I am recommending you buy the IOTA token which forms part of the IOTA Project's decentralized tangle-based network.

We have shared analysis on this cryptocurrency before, including a full report from my colleague Harry Hamburg. Read the report to get details on how to buy and store IOTA securely. Ensure that you read that guide closely.

You will find the report here.

I have to admit I have a soft spot for IOTA. It's designed to solve so many of the immediate questions that arise when it comes to full commercialisation of cryptocurrencies. It has much reduced transaction fees, aims to have fee-free micro payments in machine-to-machine (M2M) economies, the network gets faster with increasing usage and it does not rely on miners, hence operates as near zero power and energy cost.

All of that suggests it is going to be of much greater use for companies in an ever connected world that 5G technology will accelerate. **The big piece of news about IOTA and its application to the industrial sector came in July 2019 when a joint venture with STMicroelectronics was announced.**

IOTA's Tangle will be integrated with ST's STM32Cube expansion software so that each of the company's chips will be IOTA enabled for future applications.

For context, STMicroelectronics is the largest semi-conductor manufacturer in Europe. It has over 100,000 customers world-wide. And is a tier-1 supplier to the likes of Apple, Bosch, Cisco, Continental, HP, Samsung, Sony and Western Digital, among others.

Its STM32 microcontroller can be found inside iPads, Airpods, MacBooks, Sony Playstations, Nintendo's Switch console and a plethora of other consumer devices. The STM32 is the 'genesis chip' I have been talking about. But while STM might appear to be the natural play here, I believe the smart, bigger potential play is to invest in the underlying technology network that makes the genesis chip so special – provided by the cryptocurrency project: IOTA

You see when it comes to the massive game changing ideas like 5G, the true power of what it can deliver comes via the network effect.

It's a bit like having the world's most advanced smartphone – it has all the best, latest, most pioneering technology packed into it. It is revolutionary, it is game-changing, it could be worth billions just on its own.

But without an entire network to enable the smartphone to connect, share information, share data and transact with others on the network, then it's effectively useless and worthless.

The power, the value, the opportunity comes in the networks that connect devices,

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machines, that create all new economies in a 5G connected and enabled world. This is the future we're steeping into with 5G and it's the power and opportunity in a breakthrough network like IOTA that I think lays the ground work for investors to make a play into something that the mainstream completely misses.

Now, while the STM partnership is a big deal for IOTA, in and of itself this is big news but it has not done anything to support the IOTA price. Part of the reason for that is because there are currently no compelling commercial applications for IOTA that make it a must have. The promise of what is possible is in the future. The number of companies offering exposure to Tangle integration continues to expand but the one missing ingredient is urgency.

5G's rollout brings much needed urgency to the IOTA market. The increase in bandwidth, lower latency and greater potential will increase usage. That's simple economics 101. The challenge with internet of things applications is ensuring they are secure but also that they can potentially create a business use case on their own. Creating an environment where sensors can pay for themselves is where the growth of the internet enabled machine or part goes parabolic and that is what the Tangle offers.

I don't expect this to be immediately reflected in the IOTA price but it is increasingly likely that the network potential of 5G will be priced into the asset as the large number of commercial agreements the IOTA foundation has formed approach commercial utility.

My forecast for the value of the IOTA token is that within a year it will be trading at least US$1. At the time of writing it is trading at US$0.20. It's been ranging between US$0.10 and US$0.30 since January 2020 so it is accurate to state it is currently about mid-range. There is the chance that the price will trade back down to the lower side of the range and potentially even exceed the lows. However, if IOTA comes close to achieving even a fraction of its market potential with the advent of 5G enabled apps there is a good chance it will trade significantly higher.

Cryptocurrencies are high risk and volatile so it is important to remember to only invest what you can comfortably afford to lose.

Cryptocurrencies are an unregulated market. Digital currency coins are encrypted to keep them secure. The encryption identifies the currency itself, but not its owner. This means that if a coin is stolen, you have very little recourse in getting it back. The Financial Conduct Authority (FCA) does not regulate the cryptocurrency market. This means that you will not have the protection of the Financial Ombudsman Service or the Financial Services Compensation Scheme.

My recommendation is to own IOTA, despite the fact it has not yet broken out, because when cryptos move, they really move. But you should always pay serious attention to the risks before making a decision on whether to invest.

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You should also check the latest Frontier Tech Investor updates and portfolio for the latest information on recommendations in case any information has changed.

There is a coming event that could really send IOTA on a price run…

How IOTA's "coordicide" makes all other cryptos obsolete

As I have explained, IOTA is feeless, doesn't need miners, can be used with complex smart contracts and actually speeds up as more and more people use it.

It's that last point that's really the "revolutionary" part.

Whereas most networks – Ethereum, bitcoin… mobile phones, the internet… – slow down the more people use them, IOTA actually speeds up.

So its transactions per second (TPS) is essentially limitless.

And the way it does this is extremely elegant. Instead of using a blockchain like bitcoin and Ethereum, it uses a directed acyclic graph (DAG).

This means that it can remain immutable and dynamic.

Now, if you're a normal person those last two paragraphs probably just sound like gibberish. So I'll explain.

Basically, when you make a transaction on IOTA, you need to verify two previous ones before yours goes through.

It's as simple as that.

And because the people making the transactions are doing the verifying, there is no need for miners and so no need for fees.

So you end up with a feeless crypto that speeds up as more people use it.

Unlike most major cryptos that are working on scaling solutions after the fact, IOTA was simply designed with scaling in mind from the beginning.

And because it's feeless, that makes it perfect for machine-to-machine micro transactions.

IOTA is designed to be the backbone of the Internet of Things, IoT. Hence the name IOTA.

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And the Internet-of-Things (IoT) wider industry value is projected to be worth a staggering $1.6 trillion by 2025.

What's happening?

As I said, IOTA promises to fulfil all the promises of crypto on a single platform.

But up until now, it's been just that, a promise.

That's because IOTA relies on something called the coordinator to make sure its network runs as it should.

Because of this, IOTA isn't truly decentralised, and decentralisation is essentially the entire point of crypto.

Crypto's purpose is to create censor-resistant networks that run themselves, without the need for any middlemen or third parties.

So, by needing a coordinator to coordinate its network, IOTA isn't fulfilling that promise.

The IOTA Foundation has always said that once IOTA has enough transactions, the coordinator will no longer be needed. Its network will coordinate itself.

But until mid-2019, many thought this would never be possible.

Then on 27 May 2019, IOTA's co-founder, Serguei Popov, released a video saying his team had solved the Coordicide problem:

"The main goal of this event was exactly to figure out how to kill this coordinator. We call it Coordicide. And I think we… we did it. There is a lot of work to do, but we did it".

A few days later a white paper followed, with all the mathematical proofs. IOTA had done it. It'd really done it.

But of course, Coordicide would take a good amount of time to be implemented. And over the next six months, many people just sort of forgot about Coordicide.

But it's coming, and sooner than expected.

When is it happening?

On 18 December 2019, IOTA released a long-awaited roadmap. You can read it here: roadmap.iota.org.

And one of the sections was dedicated entirely to Coordicide. Take a look at it below.

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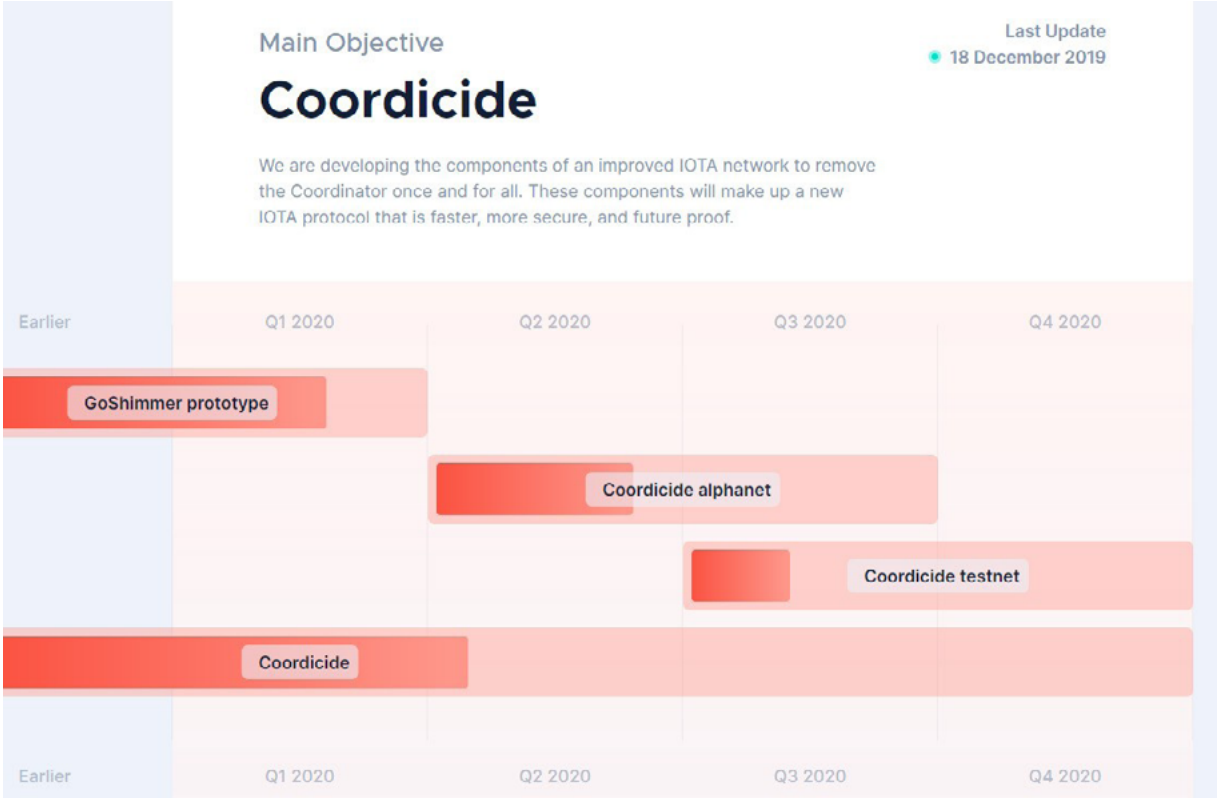

Source: IOTA

So we can now see Coordicide will be launched as an alphanet in early Q2, with a testnet following shortly after. The full release appears to be scheduled for the end of 2020.

What are the implications?

If IOTA pulls this off, it will deliver immense value to the IOTA network and potentially the IOTA tokens.

Needless to say, this could mean extreme price rises for IOTA and a likely placing in the top five cryptos by market cap – once the dust has settled.

Plus, it will enable the IoT to really get off the ground and up and running. All the best,

Sam Volkering and Eoin Treacy
Investment Director, *Frontier Tech Investor*