Entrepreneur MIDDLE/EAST

AN INSIDER LOOK

INTO CRYPTOCURRENCIES, DECENTRALIZED FINANCE, AND THE VARIOUS FACETS OF BLOCKCHAIN TECHNOLOGY IN DIVERSE REAL-WORLD SCENARIOS

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THE CRYPTO



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FOREWORD

Crypto.

Just the word incites a reaction of either eye-rolls or intense enthusiasm. Eye-rolls tend to come from those that believe it is just another form of gambling: "it's a volatile stock market equivalent, but highly unregulated. Invest at your own peril!" the eye-rollers would say. The enthusiasts are either those that bet big and won during the 2017 or 2021 crypto-craze, convinced that this is the future touting, "high risk, high rewards!", and then there are those that are excited by the philosophy of decentralized finance and intrigued by the limitless opportunities that are presented by blockchain technology and its many derivatives, from cryptocurrencies, NFTs, and the multitude of these applications in the metaverse.

One thing is for certain, regardless of which camp you belong to: crypto is no longer ignorable. Cryptocurrencies reached a collective market capitalization of over \$3 trillion in 2021. That's right, not a B for billion, but a T for trillion – a smooth 13 figures. Institutional investors like JP Morgan, Goldman Sachs and Morgan Stanley are all getting involved in the crypto-game launching crypto trading products and services for their clients. Venture Capitalists invested more than US \$32.8 billion in crypto and blockchain-based start-ups in 2021, a figure that is higher than all years prior combined. In 2021, institutional investors also doubled the amount of money they put into Venture Capital, and you can bet a chunk of that went into crypto. A Digital Assets Study issued by Fidelity in 2021 found that 90% of all institutional investors surveyed globally were not only interested in digital assets, but expected to have portfolio allocations by 2026, if they didn't have some already.

If you don't understand much about cryptocurrencies, blockchain, NFTs, DApps, or DeFi, and are interested in understanding what crypto-staking is, or what different kinds of blockchains there are and what their real-world use-cases might be - read on. If you're already a crypto-expert, and want to know what's the round-up on regulations, and what new DeFi apps are about to launch, you might get something out of this report too – perhaps focus on the spotlights and case studies on up and coming startups in this space.

This is our Crypto Review, planting a flag in the ground at the end of 2021, and asking ourselves "What are the key elements of the Crypto Universe today? How far has it come, and what's going on now that's relevant to tomorrow? What are the fundamentals that someone interested in Crypto needs to grasp, and what are the most exciting projects being announced today that can change the crypto landscape of the future?" We're not here to give you investment advice, and we do ask you to be prudent with any of your investment decisions, whether they be made in or for cryptocurrencies or plain-iane fait currencies.

By the end of this special report, we hope you have a good grasp on what cryptocurrencies and blockchain technology will mean for the world in 2022 and beyond. We won't be able to go into detail over each and every one of the 10,000 cryptocurrencies in circulation, but we hope you'll have a good understanding of the different types of cryptocurrencies out there, from Native Cryptocurrencies, Altcoins to Tokens, We want you to understand the implications of decentralized finance (DeFi) and decentralized apps (DApps), and what some of the technological upgrades that are being made right now, as you read this. We want to shed some light on the regulatory landscape, and how regulation could both positively and negatively affect crypto. And we know you're dying to understand how NFTs are related to cryptocurrencies, if at all. Come journey with us, because there's a lot to get through.

B



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INTRODUCTION

"Do you invest in crypto?" is a question that's being asked by just about everyone lately.

A SPECIAL REPORT: AN INSIDE LOOK AT THE CRYPTO-UNIVERSE

Well, depending on who you ask, these conversations have gained, lost, and gained steam again in unison with the volatile crypto-market since the last big crypto-rush in 2017; but after what many have dubbed the crypto-winter (2018-2019), the pandemic realities of being locked-up indoors have breathed new life into the world of crypto, seemingly garnering the interest of a much wider audience. The crypto rise of 2020-2021 has given way to new cryptocurrencies and tokens (referred to as Alt-Coins), faster blockchains and improved investment platforms and products.

Crypto-investing has hit all-time highs in early November when Bitcoin's price hit approximately US\$68,300 and the total market capitalization of all 10,000+ cryptocurrencies tallied up to over US\$3 trillion¹. Though volatility is still the name of the game, the 12-year old market for digital assets has roughly quadrupled from its' 2020 year-end value to November 2021; though, it should also be noted that one month later the market had dropped over 20%. So what is everyone talking about when they are talking about crypto? The purpose of this report is to get everyone caught-up on everything cryptorelated; we'll share some illuminating case-studies from some of the most exciting players in the market and highlight new projects in crypto today. By the end of this report, you should have a solid foundation on everything crypto, and get a glimpse of what's cooking next for this turbo-charged and controversial industry.

¹TIME: "The World's Cryptocurrency Is Now Worth More Than \$3 Trillion" (8 November 2021)



WHAT IS **Cryptocurrency**?

Cryptocurrency is a form of payment, like fiat currency (ie. US dollars, Japanese Yen, British Pounds, etc. are all fiat currencies) that can be exchanged online for goods and services.

It is a digital currency, that only exists on the internet – and cannot be debited out of your account in a physical form – thus, you can never physically hold a cryptocurrency in your hand. But, you can exchange your cryptocurrency into another fiat currency which can then be dispensed into physical cash if you so desire.

The first cryptocurrency, Bitcoin (BTC), was invented in 2008 by a person, or group of people, using the name Satoshi Nakamoto. Satoshi Nakamoto is anonymous and pseudonymous (written under a false name); but why? Many believe that the founder(s) of cryptocurrency have remained in the shadows so that digital currency as a system for decentralized finance (DeFi), maintains legitimacy. Digital currencies are critical to making DeFi a reality, and thus, by definition, should never be connected to or controlled by any one person or group, in theory. Others have argued that the concept of cryptocurrency and a DeFi world was so revolutionary, that anonymity was essential in order for the founder(s) to evade authorities and potential jail time, which would also in turn hamper the success of the cryptocurrency.





In October 2008 someone calling themselves Satoshi Nakamoto published a paper called "Bitcoin: A Peer-to-Peer Electronic Cash System" to an obscure cypherpunk email list. Cypherpunks are any individual advocating the widespread use of strong cryptography and privacy-enhancing technologies as a route to social and political change. The abstract of Nakamoto's whitepaper read: "A purely peer-to-peer version electronic cash would allow online payments to be sent directly from one party to another without going through a financial institution. Digital signatures provide part of the solution, but the main benefits are lost if a trusted third-party is still required to prevent double-spending. We propose a solution to the double-spending problem using a peer-to-peer network. The network timestamps transactions by hashing them into an ongoing chain of hash-based proof-of-work, forming a record that cannot be changed without redoing the proof-of-work. The longest chain not only serves as proof of the sequence of events witnessed, but proof that it came from the largest pool of CPU power. As long as a majority of CPU power is controlled by nodes that are not cooperating to attack the network, they'll generate the longest chain and outpace attackers. The network itself requires minimal structure. Messages are broadcast on a best effort basis, and nodes can leave and rejoin the network at will, accepting the longest proof-of-work chain as proof of what happened while they were gone." If you're curious to read the original whitepaper, check it out at: https://bitcoin.org/bitcoin.pdf.

At its essence, Bitcoin was a revolutionary concept which was an amalgamation of ideas around freedom, money, technology, computing, politics, and philosophy. Nakamoto's primary motivations was to create a decentralized digital currency outside the control of a central bank. In 2011 he wrote, "The root problem with conventional currency is all the trust that's required to make it work. The central bank must be trusted not to debase the currency, but the history of flat currencies is full of breaches of that trust, Banks must be trusted to hold our money and transfer it electronically, but they lend it out in waves of credit bubbles with barely a fraction in reserve."

Though the October 2008 whitepaper was passed around and debated by a select few cypherpunks, it seemed few believed that it would actually come to fruition, let alone succeed. Less than 3 months later, in January 2009, Nakamoto brought the Bitcoin network into existence by mining the first block of the ledger (what we now call blockchain technology). Nakamoto embedded the text "The Times 03/Jan/2009 Chancellor on the brink of second bailout for banks" in the first block of the blockchain, alluding to the global financial crisis which was taking center stage at the time. This is also an important note in terms of timing, as much of the world was becoming increasingly mistrustful and disillusioned towards institutional banks and traditional financial institutions at the time. Nakamoto and a coder named Hal Finney began to fix the bugs in the first decentralized digital currency now both famous and infamous, Bitcoin.



It's interesting to note that Nakamoto had a strong presence online in the early days of the release of Bitcoin, writing about the cryptocurrency and philosophy behind it and answering questions via emails to the same cryptography mailing list. In April 2011, Nakamoto wrote his final email to the same mailing list, stating "I have moved on to other things. It's in good hands with Gavin (Andresen) and everyone." Gavin Andresen, who had discovered bitcoin in 2010 and considering its design to be brilliant, had created a website in the early days of Bitcoin named "The Bitcoin Faucet" which gave away Bitcoin. He joined the online community of developers contributing to Bitcoin and went on to become the lead developer of the client software for the bitcoin network when Nakamoto passed on Bitcoin's source code. To date, no one has "met" Nakamoto, or can confirm his or her identity.

April 2021 marked 10 years since anyone has heard from Nakamoto. On this 10 year anniversary of sorts, Bitcoin was worth nearly a trillion dollars (US \$930 billion to be exact), and is not under the control of any government or bank. Because the Bitcoin blockchain is a public ledger, it is possible to see Nakamoto's bitcoins on the Bitcoin blockchain, which totals to approximately 1.1 million bitcoins in Nakamoto's name. Even more intriguing, these 1 million Bitcoins have never been moved (sold), despite it being worth between 50 to 73 billion dollars. If Nakamoto were a single person, as of the November rally, Nakamoto would have been the 15th richest person in the world².

It is important to note that Nakamoto's invention of the Bitcoin blockchain was a groundbreaking achievement in computer science that was built on the work of many others in the field, but it was Nakamoto's invention of the proof-of-work consensus algorithm that solved a fundamental computational issue called the "Byzantine Generals Problem" which prevents doublespends and makes a decentralized digital currency possible.

²Independent: "Bitcoin Creator Satoshi Nakamoto Now 15th Richest Person in the World" (15 November 2021)

Many companies also issue their own cryptocurrencies, often called tokens, and these can be traded specifically for the good or service that the company provides. It's best to think of these tokens as casino chips or arcade tokens, as users will need to exchange them for real currency (fiat currency) for the cryptocurrency to access the goods or services. Cryptocurrencies work and are transacted in the world using blockchain technology (Read more about blockchain technology on page 15).

EXAMPLES OF COMPANIES LAUNCHING TOKENS WITH VARIED SUCCESS:

🗞 BINANCE

Binance, the largest cryptocurrency exchange platform in terms of daily trading volumes, launched **Binance Coin (BNB)** in 2017, shortly after establishing the platform. In the first 6 months of the Initial Coin Offering (ICO), the Binance token (BNB) soared from 10 cents to \$13, giving it a market capitalization of US\$1.3 billion³. At the end of 2021, the BNB token's market capitalization has grown to over US\$88 billion⁴. Read more about Binance's meteoric rise and its founder Changpeng "CZ" Zao on page 11.



Telegram Messenger founders, the Durov brothers, announced in 2017 that it will be launching its own blockchain project named "Telegram Open Network" (TON), which has since been renamed "The Open Network" (TON), when Telegram withdrew participation in the project after litigation from the US Securities and Exchange Commission (SEC). TON was described as a platform for decentralized apps and services, similar to Google Play or the Apple Store – and a decentralized alternative to digital payments using its own cryptocurrency or token called "Gram". As of April 2018, the ongoing Initial Coin Offering (ICO) of the "Gram" had reportedly raised US\$1.7 billion in funds to help the self-funded Telegram company further develop this project". The TON blockchain was being tested throughout 2019-2020, but the lengthy court battle with the SEC ended the project in 2020. Telegram was forced to return US\$1.22 billion in Gram purchase agreements, and pay a \$18.5 million penalty fine to the SEC⁵.



In December 2020, Apple co-founder Steve Wozniak launched his new company **Efforce**, a blockchain-based "energy efficiency market" for crowdfunding eco-friendly business projects. The launch coincided with the company's digital token offering, WOZX, which investors drove up to a \$950 million market capitalization in the first 13 minutes⁹. WozNaiak noted in a press release that "Efforce was created to be the first decentralized platform that allows everyone to participate and benefit financially from worldwide energy efficiency projects, and create meaningful environmental change." WOZX peaked on 9 December 2020 at \$3.15 per token and has been on a volatile but general decline. On 9 December 2021, WOZX was priced at \$0.33 cents per token, an >90% decline⁹.



Fintech giant **Revolut**, valued at over \$33 billion¹⁰, announced in September 2021 that it is looking to launch their own cryptographic token, similar to Binance's BNB, as opposed to creating a stable coin. The United Kingdom's Financial Conduct Authority (FCA) is reviewing the case and launch of such a token is said to be pending the approval.

⁵Techcrunch: "Telegram to pay SEC fine of \$18,5 million and return \$1,2 billion to investors as it dissolves TON" (26 June 2020) ⁶ Telegram Open Network Whitepaper, Dr. Nikolai Durov (2 March 2019)

⁷Fortune: "Even as Bitcoin Languishes, Telegram Raises \$1.7 Billion Ahead of Largest ICO Ever" (31 March 2018)

⁸ NASDAQ: "Apple Co-Founder Wozniak's New Venture Lists Token to Help Fund Energy Efficiency Project" (5 Dec 2020) ⁹ Coin Market Cap

10 CoinDesk

³ Forbes: "From Zero to Crypto Billionaire in under a year: Meet the Founder of Binance" (27 February 2018) ⁶ Coin Market Cap

SPOTLIGHT | BINANCE

IN FOR THE LONG HAUL

Binance founder and CEO Changpeng Zhao is going all in for crypto



by ABY SAM THOMAS, Editor in Chief, Entrepreneur Middle East



One of the first things I noticed about Binance founder and CEO Changpeng Zhao when I met with him in October 2021 was the fact that he had tattooed the diamond - shaped logo of his company - which, by the way, is the largest cryptocurrency exchange in the world today - on his right forearm. Zhao, or CZ as he's more commonly referred to, went on to tell me that he had got the tattoo in 2018, a year after he had launched Binance, and in a Medium post commemorating the event, he painted it as a demonstration of his lovalty to the enterprise he had built - as he put it then: "We - Binance - are here to stay. And we are serious about building a lasting brand." And that appears to remain the ethos with which CZ continues to run the show at Binance today, which, while soaring to greater heights as a global business, is also battling several regulatory challenges in different countries around the world. But such headwinds don't seem to have shaken CZ's belief in what he has built, and I personally get the clearest indication

of this when he tells me about tattooing the Binance logo on his arm. "This is the only tattoo I have, and I don't plan to get anymore," CZ declares. "For me, this logo is meaningful enough to stay with me for the rest of my life."

CZ's commitment to Binance can perhaps be better understood when one looks at how he came to launch and lead the business to what it is today. While he was born in China in 1977, CZ migrated with his family to Canada in the late 1980s, which is where he ended up securing a bachelor's degree in computer science as well. He then went on to work as a programmer developing financial trading systems, which heralded the start of a career trajectory that ended with him launching a business of his own in the same domain some years later. This was followed by his entry into the crypto realm in 2013, with his interest in the sector piqued after he studied the now famous Bitcoin whitepaper attributed to Satoshi Nakamoto. He then proceeded to get a lay of the land by working at a few crypto firms for a few years, before eventually seeing the potential of creating a new cryptocurrency exchange in this particular milieu. While there were already quite a few such platforms operating on the internet at the time, their interfaces were clunky and glitchy, and CZ particularly remembers their customer support as being rather abysmal. Given his background in finance and technology, CZ knew that a better cryptocurrency exchange could be built, and that's exactly what he set out to do.

CZ launched Binance in July 2017 after raising US\$15 million in an initial coin offering, and the platform found itself being welcomed with open arms by the crypto community – and in an incredibly swift manner, I might add. In fact, by March 2018, CZ proudly announced that Binance had already become the world's largest cryptocurrency exchange, and that it had recorded \$200 million in profits at the end of its second ever quarter. Looking back on Binance's meteoric rise to the top, CZ believes that there were a few key factors that led it to this achievement. "We had a good product and service, but the third thing that worked in our favor was that we always protected our users," CZ says. "So, any time we had to make a decision, we made sure we protected our users, and that



worked out really well for us. We got lucky too - the market was booming in 2017. We rode that wave, and yeah, the rest is pretty much history." Today, Binance is reportedly well on its way to securing more than \$1 billion in profits by the end of 2021, but it has also evolved into something much bigger than what it was when it launched. "Most people know of Binance as a crypto exchange," CZ says. "That's

still our main business, but Binance has evolved way beyond that. We have a large ecosystem of no less than a few hundred different products or projects." CZ is referring here to the many different concepts that fall under the Binance umbrella today. These include a mobile wallet for cryptocurrencies (Trust Wallet), a cryptocurrency credit card (Binance Card), a price-tracking website for cryptoassets (CoinMarketCap), a marketplace for non-fungible tokens (Binance NFT Marketplace) – this list can go on and on. But CZ wants morehe is hoping for this ecosystem to grow even further with new projects that are built on Binance's underlying blockchain technology. "We have one of the most active blockchains in

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the space, Binance Smart Chain, which carries about 10x transactions compared to Ethereum," he notes. "We want Binance to be a platform of platforms - we want to be the platform for other people to build platforms on top of us... We want to make this platform available for other entrepreneurs to build in this ecosystem." This would thus explain Binance's announcement in October of a new \$1 billion Crypto Mass Adoption Fund for Binance Smart Chain "to accelerate the adoption of crypto assets and blockchain technology," A statement noted that

half of the fund will be marked out for investments to grow decentralized computing, gaming, metaverse, virtual reality, artificial intelligence and blockchain based financial services, while the rest will be divided among Binance's Builder Program, Liquidity Incentives, and Talent Development initiatives.

Given all that is going on at Binance right now, it may come as a surprise that the company still doesn't have a centralized headquarter, and that it works with a team that continues to be spread across the globe. And while this may make sense when considering the inherently decentralized nature

SPOTLIGHT | BINANCE

of the business, it's been marked out as a key pain point by regulators in several countries around the world, who are now keeping a close eye on the crypto space following concerns relating to consumer protection and illicit activity in this arena. In fact, Binance has run into trouble with the authorities in countries like the US, UK, Japan. Malta, and others, with many of whom point out that the company is not licensed or registered to operate a cryptocurrency exchange in their jurisdiction. But while such issues have certainly put a dent on Binance's profile as a business, CZ makes it clear that his enterprise is very much open to the idea of regulation. According to him, while the lack of a central authority may have been one of the key reasons for the appeal and rise of the crypto industry, working with regulators is the way forward for this asset class to grow further. "There are many advantages for us to embrace regulation now," CZ explains. "I think that today, most people have probably heard about crypto, but probably less than 2% of them have some kind

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of crypto... And those are the early adopters, who are willing to put, like, their savings into a website that's located offshore, with no office space, no licenses, etc. But the majority of people won't do that - they will trust a platform that's licensed by a government regulator more. As such, having licenses will allow us to access the 98% of

the market that we can't access today." CZ also points out that while Binance currently has one of the largest market shares on the crypto landscape, the exchange space has a long tail of other, smaller players trying to also grab a piece of the pie – but regulation will almost certainly cut them out. "Only a few large players will remain," CZ predicts. "And so, regulations will actually help us to grow even further in terms of our market share." At the same time, given that crypto is still an emerging asset class, CZ believes that working with regulators will allow Binance to positively contribute to how the industry is shaped in the long term and that's something CZ is happy to invest in.

It's this last point that will explain Binance's recent hiring of a number of big names in the regulatory space to its compliance and executive teams. Those of us in the MENA region will recognize some of them – for instance, there's Mark McGinness, former Head of International Relations at the Dubai Financial Services Authority, who joined the company as its Chief Regulatory Liaison Officer, as well as Richard Teng, former CEO of the Financial Services Regulatory Authority at Abu Dhabi Global Market, who is today the CEO of Binance's operations in Singapore. CZ believes that getting ex-regulators on board Binance will yield a couple of benefits, chief among them being the fact that the company will get the input it needs to set up all of the necessary checks and balances to have it looked at by regulatory authorities in a more favorable light. "In addition to that, when we hire those guys, those guys have trust of their ex-colleagues," CZ notes. "When those guys say, 'Look, I saw what's going on here, and I'm comfortable with it," they have trust, whereas when the regulators talk to me, they're somewhat skeptical of what I say, since I'm a 'crypto guy,' right? So, hiring such people, who can build trust and communicate with regulators, is a very important thing for us." It's curious to see CZ be this open to regulation of his enterprise and industry, especially since that's what blocked Binance from carrying out some or all of its operations in several countries around the world.

several countries around the world. "With respect to our offerings, yes, there are certain locations where regulators have expressed their dislike of certain products, like, say, futures in Europe, and we limited that already," CZ says. "So, we restrict our product offerings for the short term. It does hurt our business a little bit, but long-term, it gives us that access to grow more, which is actually more important to us. In the future, we can apply for

licenses for more advanced or exotic products that can still be enabled." Indeed, these dialogues that have been initiated between Binance and regulators bode well for the future, CZ says. He brings up the example of the UK's Financial Conduct Authority (FCA), which, in June 2021, issued a consumer warning stating that Binance is not permitted to undertake any regulated activity in the country, with the entity also imposing a set of requirements on the company as well. This announcement was covered prominently in media outlets around the world- however, what didn't get as much attention was the FCA's update on the same two months later, where it said that Binance had ended up complying with all of the requirements it had imposed on it. "Unfortunately, the warning was covered by all the media, but, of course, the update is boring, and nobody covered it," CZ smiles, wistfully noting the tremendous amount of work Binance did in two months to ensure compliance. But regardless of whether Binance's efforts to work with regulators get noticed or not, CZ is certain that the realm he works in is bound to become

a lot more mainstream than what it is today. "It will take time to change the perception," he says. "But we are here for the long term." And according to CZ, this is essentially why Binance is making a concerted effort to reframe itself as an enterprise. "Now, we're taking the approach of, okay, for a centralized exchange, let's have a centralized structure that the regulators will understand," CZ says. "Let's have proper shareholders, proper cap table, proper board, proper governance structure, proper office headquarters, proper everything. So, we're setting that up. We're setting up multiple regional headquarters, plus a global headquarters as well." But do such efforts by Binance take away from the decentralized nature of the crypto world, I ask. "The crypto world is great, but today, 99% of money is still fiat," CZ replies. "And in order for that money to flow in, we need integration - we need to integrate the crypto space with traditional financials. And doing this integration with traditional frameworks doesn't undermine crypto." In fact, if the argument being made is that those in crypto need to stay true to the actual principles of decentralization, then such collaborations are a necessity, says CZ. "If you have a decentralization mindset, it should not be exclusive," he points out. "You cannot be against somebody. In a decentralized space, you want as many possibilities to evolve as possible. So, on the centralized part, we're evolving; on the decentralized part, also, we're evolving. It doesn't take anything away. It's a natural evolution of both parts, and not just one part." At the end of the day, CZ points out that crypto is still a very new concept for most of the world, and it is going to undergo a lot more change as it becomes a more inherent part of our day-to-day lives. As for those disparaging this space, CZ compares them to those who decried the internet as it dawned back in the 90s.

"I think the skepticism will always be there, but over time, the adoption will increase, and skepticism will decrease," he says. However, CZ also notes that it pays to be an early adopter - he himself had sold his house to go all in on Bitcoin in 2014, and well, he's certainly reaping the rewards of that decision today. In fact, according to Bloomberg's Billionaire Index, CZ has joined the ranks of the world's top billionaires, with an estimated net worth of at least US \$96.5 billion. But CZ makes it clear that he wouldn't recommend going that route to most people - they should invest only what they are willing to risk, he says. "For me, the way I do risk management is that if Bitcoin went to zero, I can get a job at a bank, and I can support my family and my lifestyle - I have a pretty basic lifestyle anyway. So, for me, the risk is quite low, and it was so even when I went all in. But that doesn't have to be the case for others. Risk is different for each of us. But, for me, once I learned that this is the future, I decided I am not going to miss it. And that decision well, it has worked out so far." As for the road ahead, CZ hopes that Binance will become a provider of key infrastructure services in the crypto space. And when it comes to his own personal goals, CZ says that he's happy to dedicate the rest of his life to Binance - be it as its CEO as he is now, or even simply as a member of its community in the future. "I just want to know that I've contributed to the world," he says. "And that's good enough."

"For me, the risk is quite low, and it was so even when I went all in. But that doesn't have to be the case for others. Risk is different for each of us."

BLOCKCHAIN TECHNOLOGY?



Cryptocurrencies work using blockchain technology. A **blockchain** is a distributed database that is shared among the nodes of a computer network.

As a database, a blockchain stores information electronically in digital format. Blockchains are best known for their crucial role in cryptocurrency systems such as Bitcoin, for maintaining a secure and decentralized record of transactions (also known as a shared public ledger). The innovation with a blockchain is that it guarantees that fidelity and security of a record of data and generates trust without the need for a trusted third-party.

DEFINITIONS:

Blockchain: is a technology that creates a shared public ledger of transactions organized into "blocks" that are timestamped and "chained" together to prevent tampering.

Miners: Mining is the process in which new transactions are confirmed on the blockchain and a critical component of the maintenance and development of the blockchain ledger. Miners compete with each other to be the first to complete auditing the ledger; the winning miner often gets rewarded in cryptocurrency or some other incentive determined by the blockchain.

Proof-of-Work (PoW): is one method in which miners work to accomplish when cryptocurrency mining; in essence, PoW is a decentralized consensus mechanism that requires members of the network to expend effort solving an arbitrary mathematical puzzle to prevent anybody from gaming the system. Proof of Work is used widely in cryptocurrency mining, for validating transactions and mining new tokens and was the original method developed by the Bitcoin Blockhain.

Proof-of-Stake (PoS): is another method in which miners work to accomplish when cryptocurrency mining; in essence, PoS reduces the amount of computational work required to verify blocks and transactions in the blockchain; PoS changes the way that blocks are verified by using the machines of coin owners, instead of general miners. Instead of miners, coin owners with staked coins become 'validators'. Validators are then selected randomly to mine or validate blocks, rather than using a competition based system. It is widely understood that PoS is more scalable and more energy efficient than the PoW method. One key difference between a typical database and blockchain is how the data is structured and stored. A blockchain collects information in "blocks", a cluster of information. Blocks have certain storage capacities, and when fulfilled, each block is closed and linked to the previously filled block – thus creating a chain. When a block is added to the chain, it is given an exact timestamp. A new block cannot be chained to an old block, until the new block is validated by a network of **miners** using either "**Proof-of-Work** (PoW)" or "**Proof-of-Stake** (PoS)" methodology. Whatever the methodology and protocols in place, the structure of the blockchain makes it inherently irreversible.

There are several layers to blockchain architecture, as shown in the diagram. The applications and presentation layer is the DApps layer that most of us consumers see and utilize; think of the Binance App, downloadable from the various app stores. The consensus layer is the layer where the PoW or PoS methodology takes place, where stakeholders validate the blockchain and provide "approval by consensus". The consensus layer is the most critical layer of the blockchain, and ensures that the blocks on the blockchain are validated, in order, so that the power stays decentralized and diffused, making it essential to the integrity of the blockchain. The blockchain's network layer (or propagation layer), commonly referred to as the P2P layer, is responsible for disseminating information, and synchronizing activity through internode communication. A blockchain's data layer comprises the way in which data is structured to create the lists within each block of transactions; it ensures security, integrity and irrefutability. Some characteristics of the data layer include digital signatures, encryption, linked lists and pointers to previous transactions. Finally, the hardware or infrastructure layer refers to the physical servers that exist in multiple data centers distributed throughout the globe, that stores all of the content and data of the blockchain. As blockchain is a P2P network, the data is shared amongst millions of computers around the world.

The first blockchain technology developed was the Bitcoin blockchain, but many others have emerged that are upgraded versions of the original bitcoin blockchain. For example, the Ethereum Network (blockchain) was created in order to do more than record transactions, but actually record and execute **smart-contracts** between parties. Other blockchains have looked to dramatically improve the speed and scalability of the blockchain, which would help in increasing utility of the blockchain for many more applications. For example, Visa's VisaNet electronic payment network can process over 20,000 transactions per second, while Bitcoin's main blockchain can only handle up to 7 transactions per second, and suffers from high transactions costs, especially during times of congestion. The challenge in developing the "ultimate blockchain" is in

LAYERED STRUCTURE OF THE BLOCKCHAIN ARCHITECTURE

APPLICATION AND PRESENTATION LAYER

Smart Contracts • Chaincode • DApps • UI

CONSENSUS LAYER

Pow • PoS • DPoS • PoET • PBFT

NETWORK LAYER

Peer to Peer (P2P)

DATA LAYER

Digital Signature • Hash • Merkel Tree • Transaction

HARDWARE/ INFRASTUCTURE LAYER

Virtual Machine • Containers • Services • Messaging

Source: Coin Telegraph, InBlog, EMW Advisory Research



solving the **blockhain trilemma**: a commonly held notion that in terms of **decentralization**, security and **scalability** – blockhains can only provide 2 out of the 3 benefits at any given time. Currently, blockchains generally provide strong decentralization and security, but scalability is the biggest challenge faced by the industry as cryptocurrency becomes more mainstream and demand increases.

SPOTLIGHT | REEF

AGGREGATING PROTOCOLS TO BECOME THE MOST USER-FRIENDLY ONE-STOP-SHOP BLOCKCHAIN FOR DeFi



Denko Mancheski's latest crypto project is Reef (reef.io). The founder and CEO named the project Reef because a reef is where all sea life come together, all in one place. He launched Reef in the "2020 Summer of DeFi" because he wants to create a symbiotic ecosystem for the world of crypto and DeFi. Denko sat down with us at our offices in Dubai to discuss the Reef project.

Today, Ethereum DeFi activities are fragmented and a pretty painful experience; it seems for every protocol or action you want to take – whether it be staking and lending, trading on decentralized exchanges, derivatives, payments or trading NFTs – there's a separate decentralized app (DApp), and for every DApp, there are unique wallets and tokens that are needed to use each. Thus, Reef is an ambitious project that seeks to become the premiere blockchain for DeFi, NFT and gaming applications. These are all DApps that require high throughput because of the number of on-chain transactions required when adding and removing liquidity, trading, minting NFTs, buying NFTs, and even in-game actions like attacking a character. Reef seeks to create a seamless user-interface and user-experience to make it easier for people to use a blockchain DApp for the first time. This is made possible by the Reef team, now a legion of 35 developers, community managers, marketing, business development, and legal players, developing what they claim is the most advanced Ethereum VM-compatible layer 1 blockchain available today. In our interview with Mancheski, he also explains: "So much can be optimized on Ethereum, it makes sense for us to try. Ethereum gas (transaction) fees are so high, it's creating major barriers to entry for retail investors. The governance structures have major room for improvement." Mancheski is referring to Ethereum's current Proof-of-Work consensus layer, which is extremely energy intensive and results in expensive and unreliable transaction fees. Ethereum has announced that it will try and implement a blockchain fork to begin transitioning to a more cost and energy efficient Proof-of-Stake consensus layer, but that remains to be seen. Mancheski claims that "Reef is taking the best of Substrate and Ethereum; our governance structure is based on a hybrid model which uses both Proof-of-Stake by nomination, as well as validators using a unique 'Proof-of-Commitment' protocol;" the latter is an invention by the Reef team.

Reef.

Reef stands for "Reliable, Extensible, Efficient, and Fast." Reef claims their blockchain is the "most advanced EVM compatible layer 1 blockchain, built using the Substrate Framework; it provides high scalability, enables low transaction costs, and allows seamless integration so developers can instantly migrate their DApps from Ethereum to Reef Chain without changing its codebase. Reef Chain is built to be self-upgradeable and has on-chain governance. Its Reef Token (REEF) has utility too, used for paying for transactions, running validator nodes by staking REEF Tokens, and voting on how Reef Chain should be run (for example.



nominating and voting on which validator nodes should be part of the network). What's revolutionary about Reef Chain is its ability to accept DApp codebases from Ethereum and other EVM chains today, along with new virtual machine support being built alongside it. This allows developers to tap into a large community hungry for low transaction fees, high scalability, and being able to natively participate in the operation of the blockchain by nominating validators, earning a portion of the transaction fees in the process. In essence, it allows developers building DApps to program in multiple (coding) languages.

When asked how he would respond to those that say his project is too ambitious, especially when much smaller crypto-projects fail, Mancheski replies, "Every cycle you have different trends; right now it's NFTs, tomorrow it will be something else. The cool thing about infrastructure projects is that they always survive because you will always

need the layer on which the DApps will run. Because Reef is so flexible and adaptable to what the ecosystem needs, the technology can't be deprecated: I expect Reef to be one of the top 5 blockchains in the world within the next 5 years. DeFi, NFTs and gaming are only becoming more common, and are all beginning to interact with each other where you can earn in-game items that are NFTs, and then lend out the items to others and get paid to do so. It's a major catalyst for talented people to benefit from their gaming or financial acumen." Many investors seem to agree, as Reef is backed by Funds and Venture Capitalists. That said, REEF token investors haven't had a good run in 2021; REEF's market cap reached an all-time high on May 11, 2021 at US\$646 million, and then finished the year at US\$236 million, a 63% drop. Mancheski doesn't seem phased. He's focused on the development of the project and launch, and I suppose all we can do is wait and see.

TYPES OF BLOCKCHAIN TECHNOLOGY AND THEIR REAL-WORLD USE CASES

Not all blockchains are developed for trading cryptocurrencies, though that is the application that you likely hear of most often.

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Blockchains can be deployed by private companies and even governments that understand the technology to utilize in real-world applications. Here are just a few examples of how blockchain technology can be deployed and employed:

- Supply Chain Logistics and Monitoring (tracking a. products)
- b. Secure and Efficient Voting Mechanism
- Secure Storing and Sharing of Medical Data с.
- Personal Identity Security d.
- Real-time Internet-of-Things (IoT) operating systems e.
- Music Rovalties Tracking f. Cross-Border Payments (without long wait times or g. intermediary bank charges)
- NFT marketplaces (exchange)
- h. Cryptocurrency Exchange i.

Now lets get into the different types of blockchains and some of their real-world examples of use-cases. There are 4 Types of Blockchain Technology:

- 1. Public Blockchain
- Private Blockchain 2.
- Federated Blockchain / Consortium Blockchain 3.
- Hybrid Blockchain 4

4 TYPES OF BLOCKCHAIN TECHNOLOGY



Public Blockchains are what we think about when we think about the original cryptocurrency blockchains, or "mother blockchain"; they are unrestrictive and open-sourced, which means anyone with internet connectivity can get access to the network and start validating blocks and sending transactions. This means that every node has access to read and write on the ledger, and anyone can download and add nodes to the network. To date, most all public blockchains use either the Proof-of-Work or Proof-of-Stake consensus algorithms to validate transactions and the blockchain. It offers anonymity, which means no one can trace your transactions back to you. It's fully decentralized, but it's also slower compared to private blockchains. Public blockchains are truly "public" and democratic: 'of the people, for the people, by the people'. The most famous and utilized public blockchains are Bitcoin's (BTC) blockchain, Ethereum's (ETH) blockchain, and Litecoin's (LTC) blockchain.



Real World Applications for Public Blockchain Technology

Real-world applications and use-cases for public blockchain technology include Voting and Fundraising. Companies can fundraise using public blockchain technology or governments can conduct voting utilizing public blockchain technology in order to foster greater transparency and trust amongst donors and constituents. Countries like Estonia and Canada have already implemented blockchain technology as an efficient means of a voting mechanism in their country's elections. In 2012 Estonia became the first government to implement blockchain governance by employing online voting using blockchain technology. The blockchain governance

system ensured protection against future cyberattacks. provided stronger data security and data privacy, and dramatically enhanced auditability, while taking the whole voting process online. This also dramatically reduces the cost and operational inefficiencies of in-person voting or even mail-in ballots, such as poll worker shortages, complications of using paper ballots, prolonged waittimes, and numerous points of vulnerability with regards to corruption. There are many other countries working on blockchain governance today including Australia, Denmark, Switzerland, South Korea, Japan, Russia, and Sierra Leone.

Fundraising is another application that could utilize blockchain governance in the same way as blockchain voting.



Private Blockchains were developed because not all

organizations or individuals could use public blockchains. This may be because businesses have competition sensitive and critical data that they cannot make public, should they wish to keep a competitive advantage and remain in business. Private blockchains were thus created that offers a completely private blockchains were thus created that offers a completely private environment where only invited participants are eligible to contribute. Private blockchains are governed by a single authority, operates on a closed network and has a closed ledger, making it decentralized, which goes against the core philosophy of distributed ledger technology and blockchains in general; thus it is thought that private trust, as the centralized nodes make the last call. In addition, due to having fewer nodes, many have argued that private blockchains may be less secure than public blockchains. That said, private blockchains have much more streamlined and simpler data handling processes, which means faster output, better energy efficiency, and greater privacy versus public blockchains; private blockchains are thus much more scalable than public blockchains are fung the most famous and utilized private blockchains are Ripple's (XRP) blockchain and Hyperledger's blockchain.

blockchains have a more difficult time building and achieving

Real World Applications for Private Blockchain Technology

Real-world applications and use-cases for private blockchain technology include supply chain management and asset ownership. **Walmart** utilizes a private blockchain to add transparency, traceability and reliability to their food supply chain, where employees can scan or input a few barcodes and trace a food item's origin and logistics travel-

Federated or Consortium Blockchains are a subset of a private blockchain, but instead of being governed by a single entity, federated blockchains or consortium blockchains are governed by a group (or federation or consortium) of stakeholders. This collaborative model offers some of the best use-cases for the benefits of blockchain, with the ability of bringing together businesses that collaborate together, while competing with each other. Consortium blockchains provide more decentralization than private blockchains, resulting log with dates and times and current location. In the case of asset ownership, FedEx is using a single standardized ledger as an innovative blockchain technology to guard against its chain of custody and shipment tracking.

Walmart 🔆 FedEx.

in higher levels of security. That said, there are challenges posed by consortium blockchains, including potential antitrust risk, as well as the the logistical challenges of bringing together stakeholders – both with regards to convincing all stakeholders to join and creating mutual buy-in amongst all members, but then also with regards to technological capability of all stakeholders to adopt blockchain technology (which would likely require some to significantly invest in the digitization of their data).

Real World Applications for Consortium Blockchain Technology

Real-world applications and use-cases for Consortium blockchain technology include the following examples:

MarcoPolo Network is a consortium of over 45 banks which provides an open software platform for trade finance (trade, payments and working capital financing) for banks and other market participants.

The IBM Food Trust is a consortium of food ecosystem players from producers, suppliers,

manufacturers, retailers and others creating a smarter safer and more sustainable food system for all. It allows people to track and trace where their product or ingredients within their product came from and how it was processed.

The Energy Web Foundation is a consortium of over 100+ energy market participants to accelerate the decarbonization of the global economy. The Energy Web Foundation deploys digital operating systems for energy grids around the world to make it simple, secure and efficient for clean energy assets to support the grid of the future.



Hybrid Blockchains are blockchains that are controlled by a single organization, with a certain level of oversight provided by a public blockchain that is required to perform certain transaction validations. Hybrid blockchains are in essence a combination of the public and private blockchains; they provide the privacy benefits of a permissioned and private blockchain, while also providing the security and transparency benefits of a public blockchain. Hybrid blockchains generally work in a closed ecosystem without the need to make everything public, with rules that are changeable according to the needs of the network. Hybrid blockchains offers privacy while still connected to the public network and offers decent scalability compared to public blockchains. A disadvantage of the hybrid blockchain is that there is little to no incentive for participating and contributing to the network.

Real World Applications for Hybrid Blockchain Technology

Real-world applications and use-cases for Hybrid blockchain technology include Real Estate, Retail and highly regulated markets such as financial markets:

> The first hybrid blockchain developed, XinFin, was launched with an US\$15 million ICO in 2018 primarily for Trade Finance. It is built on both Ethereum (a public blockchain) and Quorum (a private blockchain, developed by JP Morgan of the Enterprise Ethereum Alliance) and has

ambitions to be a widely used enterprise-ready hybrid blockchain, powered by its native coin, "XDC".



23 / ENTREPRENEUR.COM / 2022

A SPECIAL REPORT: AN INSIDE LOOK AT THE CRYPTO-UNIVERSE





There are many digital or cryptocurrencies, not dozens, or hundreds but over ten thousand digital currencies. Bitcoin is the main one, which comprises roughly 40% of the total crypto market value. All others are Altcoins, of which there are over 10,000 and new altcoins are being launched daily.

BITCOIN (BTC): THE FIRST CRYPTOCURRENCY EVER INVENTED.

Bitcoin, also known as BTC, is the world's first ever cryptocurrency, and it just so happens to also be the world's most valuable cryptocurrency, commanding roughly 40% of the total crypto market value. Bitcoin was revolutionary because it was the first decentralized digital currency that eliminates the need for intermediaries like banks and governments, using instead a peer-to-peer computer network to confirm purchases directly between users.

So how does it work? Bitcoin is powered by an **opensource code** or technology known as the blockchain. Blockchain is a technology that creates a shared public ledger of transactions organized into "blocks" that are time-stamped and "chained" together to prevent any kind of tampering. The blockchain is an incredibly secure record-keeping technology that allows strangers to put trust into exchanging Bitcoin and other cryptocurrencies online. Members of the global peerto-peer computer network independently confirm transactions using high-speed computers, typically within 10 to 20 minutes; these members are known as **Bitcoin Miners**. These miners are paid in Bitcoin to reward their efforts, which incentivizes the network to continue to independently verify each transaction.

DEFINITIONS:

Open-Source Code: refers to code that is designed to be publicly accessible – anyone can see, modify, and distribute the code as they see fit. Open-source software is developed in a decentralized and collaborative way, relying on peer review and community collaboration.

Blockchain: is a technology that creates a shared public ledger of transactions organized into "blocks" that are time-stamped and "chained" together to prevent tampering.

Bitcoin Mining: is the process in which new transactions are confirmed on the blockchain and a critical component of the maintenance and development of the blockchain ledger. Bitcoin Miners compete with each other to be the first to complete auditing the ledger; the winning miner gets rewarded in Bitcoin. Mining is also the only method in which new bitcoins are entered into circulation. Bitcoin mining requires energyintensive and sophisticated hardware that solves extremely complex computational math problems.

Proof-of-Work (PoW): is what miners work to accomplish when cryptoeurrency mining; in essence, PoW is a decentralized consensus mechanism that requires members of the network to expend effort solving an arbitrary mathematical puzzle to prevent anybody from gaming the system. Proof of Work is used widely in cryptocurrency mining, for validating transactions and mining new tokens. These Bitcoin Miners are essential to the blockchain working, as this network of independent miners are required to confirm the authenticity of each block of data before it's added to the blockchain, in a process known as "**proof-of-work**".

Bitcoin (BTC) has grown from a fringe experiment in decentralized finance (DeFi), to becoming many investors' golden "get-rich-quick" ticket – making overnight millionaires by the thousands. At its' height in November 2021, the combined value of all Bitcoins (BTC) was more than US \$1 trillion, exceeding market capitalizations of some of the world's largest companies including Tesla, Berkshire Hathaway and Facebook parent Meta. In February 2021, when the price of Bitcoin grew to over US\$57,000, it was estimated that there were 100,000 bitcoin millionaires. One year prior, there were only 15,000 millionaire Bitcoin accounts¹¹.

Bitcoin BTC BITCOIN (BTC) TO USD CHART (JANUARY 2016 TO DECEMBER 2021)



But how are people making money off Bitcoin (BTC) and why is it so volatile? At its essence, Bitcoin value follows the laws of supply and demand – and because there is a limited supply of Bitcoins – there are currently 18.9 million Bitcoin in circulation, 90% out of a maximum threshold of 21 million¹²(by Nakamoto's design) – this market inelasticity is one of the reasons why analysts believe the price of Bitcoin has and will remain volatile. Because there is no central bank that can artificially subdue volatility or intervene, Bitcoin's volatility is proof of a distortion-free market. It is exactly because of this volatility, that investors (with nerves of steel) are making money. After all, where there is great risk, there is the potential for great reward. Most people that are purchasing Bitcoin (or Altcoins for that matter) are doing so as a form of currency speculation; it is not dissimilar to picking stocks on the stock market or currency trading online; everyone who buys Bitcoin (and Altcoins) are hopeful that the value will increase over time.

¹¹ CBS News "There May Now Be As Many As 100,000 Bitcoin Millionaires" (23 February 2021)
¹² Business Insider "90% of all Bitcoins Have Now Been Mined" (13 December 2021)



BTC TRADING HIGHS AND LOWS BY YEAR

ALTCOINS: OVER TEN THOUSAND ALTERNATIVES TO BITCOIN.

Altcoins, by definition, are any other digital currencies that are not the original Bitcoin. At the end of 2021 there are well over 10,000 alternative digital coins you can invest and trade in. Why are there so many alternatives to Bitcoin? There are many altcoins that have adopted the same DeFi premise as Bitcoin, but are using their coins to achieve different goals, or seek to improve a perceived flaw in Bitcoin or Bitcoin's blockchain. Some altcoins have promised to be faster, more decentralized, more scalable, and/or more secure than Bitcoin, resulting in a dizzying ecosystem of altcoins.

There are 4 large buckets you can segment Altcoins into:

- 1. Native Cryptocurrencies
- 2. Tokens
- 3. Stablecoins
- 4. Forks



I. Native Cryptocurrencies: are coins that were originally created to run on their own specific blockchain network or ledger system. The top 3 cryptoassets by market capitalization are all native cryptocurrencies.

Eight of the Top 10 cryptocurrencies by market capitalization are native cryptocurrencies. The most common and most valuable examples of native cryptocurrencies are as follows:

Rank #1 (B) Bitcoin (BTC)	Bitcoin (BTC) is the first cryptocurrency ever invented, and the native cryptocurrency used on the Bitcoin Blockchain. BTC is also the world's most valuable cryptocurrency and roughly makes-up 40% of the entire cryptocurrency market capitalization; it had a market capitalization of US \$1.27 trillion at its November 2021 peak.
Rank#2	Ether, the second-largest cryptocurrency by market capitalization (valued at nearly US\$569 billion at its November 2021 peak) is a native coin on the Ethereum (blockchain) Network. The Ethereum Blockchain was launched in 2015 to improve on the Bitcoin Blockchain by doing more than just recording financial transactions as Ethereum also records agreements in the form of smart contracts . The network's users can create, publish, monetize and use (decentralized) applications (dApps) on the platform, and use Ether as payment. Ethereum is an open-source blockchain-based platform that advocates say could upend industries that rely on costly middle-men like insurance, banking and copyright management through its smart-contract process ¹³ .
Rank #3 竛 Binance Coin (BNB)	Binance coin (BNB), is the cryptocurrency issued by the Binance Exchange, the world's largest cryptocurrency trading platform. At its November 2021 peak, it had a market capitalization of US \$111 billion. When it first launched through an ICO in 2017, BNB used the Ethereum blockchain, but is now the native currency of Binance's own blockchain, Binance chain. BNB was first launched as a utility token to discount trading fees, but has since expanded its use for an entire host of applications that include travel booking, entertainment, online services and financial services. BNB is designed to offer a strict maximum of 200 million BNB tokens. (read more about Binance and BNB in the cover story on page 11).
Rank #5 Solana (SOL)	Solana is a blockchain platform launched in 2017 to host scalable dApps, using its native cryptocurrency by the same name Solana, with ticker symbol SOL. Solana is a Proof-of-Stake blockchain, but also introduced a "Proof-of-History" technology which utilizes a reliable clock to simplify network synchronization, resulting in exponentially faster transactions per second. In 2021, a Bloomberg journalist described Solana as "a potential long-term rival for Ethereum" due to Solana's faster transaction speeds and lower associated costs. At it's peak in November 2021, SOL's market capitalization reached US \$78 billion.
Rank#7 Xipple (XRP)	Ripple (XRP) is a native cryptocurrency for products developed by Ripple Labs. XRP is used for payment settlement, asset exchange and remittance systems that isn't technically a blockchain, but a "distributed consensus ledger" using a network of validating servers and XRP tokens. Ripple works in a similar way to the international banking transfer system SWIFT, and though decentralized, is owned and operated by a private company and transactions are approved by a registry called 'unique node list' (UNL) made up of trusted validators curated by the company. Today, there are ±35 active XRP validators, six of which are run by Ripple itself. Ripple provides significant benefits to traditional banking remittance systems as it settles within seconds instead of days, and costs a fraction of traditional banking systems. At its' January 2018 peak, XRP had a market capitalization of US \$131 billion; it's 2021 peak in April hovered at US\$84 billion, and was half that value at \$40 billion at the end of December 2021.

¹³NerdWallet

Cardano (ADA)

Rank #8

Cardano is an open-source, decentralized blockchain launched in 2017 by an Ethereum cofounder, that achieves consensus through proof-of-stake (which is touted to be more efficient than proof-of-work technology used by Blockchain and Ethereum; you can read more about Proof-of-Stake on Page 15). It's native cryptocurrency ADA facilitates peer-to-peer transactions. As of June 2021, 71.6% of ADA was staked in over 2,600 active pools with a value of over US \$31.4 billion. At its' September 2021 peak, ADA had a market capitalization of US \$95 billion.

Rank #9 S Terra (LUNA) Luna is the native cryptocurrency on the Terra platform, a blockchain network built on algorithmic stablecoins built for e-commerce in 2018. Terra seeks to offer programmable money that's easy to spend, with low fees, instant settlements and utility for cross-border payments. In essence, Terra has been dubbed "Alipay on the blockchain". The Luna coin is used for staking, governance, and collateral for the Terra network's algorithmic stablecoins. Luna has a dynamic supply of 1 billion coins, and at its December 2021 peak, had a market capitalization of over US \$32.9 billion.

Rank #10

Avalanche is a platform for creating custom blockchain networks and dApps launched in 2020; it is one of many projects looking to unseat Ethereum as the blockchain ecosystem's most widely used smart-contract platform. It is considered one of the fastest blockchains allowing 4,500 transactions per second. Avalanche's native AVAX coin has a capped supply of 720 million, is used for transaction fees and as part of Avalanche's consensus mechanism. Avalanche has three built-in blockchains: the Exchange Chain (X-Chain, for building and trading crypto-assets), Platform Chain (P-Chain, to coordinate transaction validators and enables the creation of new custom blockchains) and the Contract Chain (C-Chain, for smart contracts). AVAX at its peak in November had a market capitalization of US \$30 billion.

2. Tokens: are a unit of value that operates on an already existing blockchain that has a utility specific to that token. It is similar to buying arcade tokens with cash (fiat currency), specific to those games. A good analogy might be an arcade that specializes in pinball machines that may ask for a specific "pin-ball machine arcade token" to play. While another gaming arcade down the street may ask you to purchase their own arcade token to play their games. Tokens have no outside value, except for the utility in which they have been created. Some examples of Tokens include:

Chainlink

Chainlink, founded in 2017, is an abstraction layer that enables universally connected smart contracts. Built on top of the Ethereum blockchain and using a decentralized oracle network, developers can use it to convert real-world data into a blockchain-friendly format that can be read by smart contracts and vice versa. LINK is the token that's used to pay for Chainlink's services. Chainlink generally rank's in the top 20 cryptocurrencies in the world, by market capitalization. At it's May 2021 peak, LINK had a market capitalization which nearly reached US\$22 billion.

UNI ()) Uniswap Another example is the Uniswap platform, a decentralized exchange built on top of the Ethereum system. Centralized exchanges such as the stock market or Binance require deposits into an account or wallet that's connected to the exchange; however, a decentralized exchange enables direct peer-to-peer trading from one personal wallet to another. Uniswap is a popular decentralized trading protocol, known for its role in facilitating this automated trading of DeFi tokens. Launched in 2020, UNI is the token of the Uniswap exchange; UNI is a "governance token" – holders of the UNI token can vote on proposals that determine how Uniswap will operate, similar to the way traditional shareholders have a say in corporate governance.



SPOTLIGHT | WEMP

CREATING A COMMUNITY DRIVEN CRYPTO SPACE FOR WOMEN

WEMP (Women Empowerment Token) is a Community-Driven, Decentralized, DeFi / Social Cause Token. WEMP's mission is "to support and empower women globally, while providing a platform to expose more women to crypto." Social tokens are somewhat of a new innovation in the crypto world and have opened a space for a type of cryptocurrency that is based around a brand, creator, or a community. In the case of WEMP, it is all about building a community for a social cause; to bring more women into the crypto world through educating and empowering them with financial independence. WEMP aims to create an ecosystem that provides a wide range of initiatives and benefits, to not only give women their place in the male-dominated crypto space, but also to create an environment that fosters success, new opportunities, as well as serves as an inspiration for female artists, entrepreneurs, and women in general.

And not without good reason. In the USA, as it stands, more than two thirds of crypto investors are men. The gender gap of the crypto world seems to mirror that of the tech and finance sectors, with reports showing that the crypto investment gap actually exceeds the existing gap within traditional investments including stocks, ETF's, mutual funds, and real estate⁴⁴.

So how can a token be used as a social cause? For a start, WEMP ensured that their first 99 token holders were all women. They also fund women entrepreneurs and women supported charities by allocating 1% of every user transaction to each cause. On a monthly basis, the community then votes and donates a portion of the funds to the chosen charity and two women entrepreneurs to support their existing business. Such initiatives mean that even as a holder of the token, users are helping the advancement of women. Furthermore, WEMP provides free resources to help women develop deep knowledge and learn about the crypto world in addition to hosting and promoting NFTs created by women.

Since its launch in October 2021, WEMP token has had significant exposure; advertising billboard in Times Square, New York City and announcing their official marketing partnership with Vivica A. Fox, one of the most talented and widely respected Hollywood icons. They will also be sponsoring the WNBA's LA Sparks, for the upcoming season.

The founder of WEMP is Christine Curran, a successful entertainment entrepreneur. When the pandemic hit, Christine was in the middle of creating an Oscar style award show for female influencers in various categories, called the "Influential Model Awards" (IMAs). Christine was mentored into the world of crypto by long time friend and business partner, Jarrod Knowles. She quickly realized the value of what crypto offered and felt it would be a strong addition to the global IMAs event to have a token for women by women. She shared that "Having a global currency that coincides with a global event seemed like a win-win and that's how WEMP was founded."

WEMP will be the global currency for the IMAs event happening later this year. It will be used to buy tickets for the event, the livestream, merchandise and to vote for a favorite influencer to receive the "Fan Award". Beyond this, they plan to branch out to be a currency option for different businesses around the globe. South Beach Wine is the first retailer already accepting WEMP as a payment option.

WEMP was 'fair launched' which means that there was no private sale or ICO. Even the Development team burned their tokens in order to participate fairly in buying and earning the tokens they hold. In line with their community ethos and that of wider decentralized finance, any decisions governing WEMP are also made by the token holders.

The token can currently be purchased through exchange platforms UniSwap and BitMart, and soon investors will also be able to buy the Women Empowerment Token on the Binance Smart Chain. WEMP has an interesting feature to provide automatic rewards for token holders; for every user transaction, 2% WEMP rewards are granted to the holders' decentralized wallets proportional to the amount of WEMP held .

When asked what will drive investment in the WEMP token, Christine told us, "The Influential Model Awards nominees have a combined following of over 100M+. The exposure for WEMP and the amount of people that will be able to use WEMP as a currency to be part of the award show will definitely drive investors to the token. Besides that, the mission to empower women and create mass adoption benefits everyone in the crypto space. The more users the higher the market cap for the industry. And of course, for those who are all about helping others, we feel our charity and female entrepreneur component will drive massive support as well." WEMP is certainly making strides in their first quarter of operation, but whether these efforts will be enough to increase women's participation in the crypto world remains to be seen. To learn more, go to **Wemp.World**.



Christine Curran, Founder, WEMP



Vivica A. Fox, Hollywood Celebrity endorsing WEMP

14 CNBC & Acorn, "Invest in You Survey" (21 August 2021)

3. Stablecoins: were developed to peg cryptocurrencies to fiat currencies, in order to remove the price volatility inherent with other cryptocurrencies and tokens. Stablecoins don't earn any profit for holders as their value remains consistent – but there are plenty of use cases for a coin that doesn't gain or lose value by the minute. Stablecoins are good and storing value. For example, stablecoins are a good alternative to holding funds on a crypto exchange, instead of converting to US dollars. Stablecoins are also a good medium for sending and receiving funds globally. The advantage of holding stablecoins instead of US dollars when trading crypto is the transaction speed and significantly reduced transaction fees. The fastest growing use of stablecoins are DeFi platforms, where users lend stablecoins to others to earn interest, without the involvement of an intermediary banking institution. Many cryptocurrency exchanges are offering free conversions from flat currencies like US dollars into stablecoins like USD Tether (USDT) or USD coin (USDC), after which users will earn interest anywhere between 0.15% APY to 14% APY depending on the exchange. There are stablecoins that are pegged against all major currencies such as the US Dollar, Japanese Yen, Euro, and British Pound. Two of the most valuable stablecoins in the crypto-verse by market capitalization are:



Tether (USDT) is a blockchain-based native cryptocurrency launched in 2014 (using the Tether Network), and began trading in 2015 pegged at \$1.00 USD. Tether is a fint-collateralized stablecoin, which means US \$1.00 backs each Tether (USDT) in circulation, and the company behind Tether (Tether Ltd.) is responsible for maintaining the reserve amounts in fiat currency. In February 2021, 57% of all bitcoin trading was done in USDT⁴, which explains Tether's dominance. At the end of 2021, Tether/USDT had the 4th highest market capitalization of all crypto-assets at US\$77.6 billion.

Rank #7

USD Coin (USDC) was launched in 2018 and is a stablecoin like USDT pegged at US\$1.00 running on multiple blockchains such as Ethereum, Avalanche, Solana, Stellar, Algorand, Tron and Hedera Hashgraph system. Though USDT has higher trading volumes today, USDC is often described as a safer stablecoin due to its governance structure managed by the Centre Consortium, which makes greater efforts to comply with audits and government regulations (monthly audits), and provides more transparency with regards to its reserves. USDC has the 7th highest market capitalization of all crypto-assets at US\$42.4 billion.



14 CryptoCompare "Exchange Review February 2021"

4. Forks: are when a blockchain splits into a new blockchain following new set of protocols. When a group decides it wants to change the rules of one blockchain, it can validate and split the chain, and a new chain emerges ready to start logging transactions under the new rules agreed upon by those who chose to validate the fork. The original blockchain continues as normal. Forks can happen over and over and over again,

creating new blockchains and cryptocurrencies along with it. Bitcoin cash is a fork of the original Bitcoin blockchain. Ethereum Classic is a fork of the original Ethereum system. Dogecoin is a fork of Luckycoin, which in turn was a fork of Litecoin, which was a fork of Bitcoin. To date, there have been over 100 BTC forks, of which approximately 70-75% have survived and are still functional.

HOW BLOCKCHAIN FORKS WORK



There are primarily two different types of Forks to be aware of.

Soft Forks	Soft forks are seen more as a blockchain's "software upgrade"; it usually entails bringing new features or functions, and so long as it is adopted by all users, it becomes the currency's new set of standards.
Hard Forks	A hard fork happens when there is a disagreement within the community on the protocol to go forward with for the cryptocurrency, so that the new version is no longer backward compatible with earlier blocks – creating a split into two different blockchains: the original blockchain and the new blockchain with a new set of rules. The latter "new blockchain" creates an entirely new cryptocurrency. Bitcoin Cash or Bitcoin Gold were hard-forks from the original Bitcoin blockchains.

SPOTLIGHT | BITCOIN LATINUM

THE NEXTGEN CRYPTO - GREENER, FASTER & MORE SECURE



Bitcoin Latinum (LTNM) is a next generation, fully insured, asset-backed cryptocurrency. LTNM is a hard fork of the Bitcoin blockchain, and it aims to be greener, faster, and more secure than the bitcoin blockchains that have come before it. Additionally, Bitcoin Latinum have committed to achieving a net-zero carbon footprint over the next decade from the power consumption linked to their crypto-related operations.

It is no secret that there are inherent issues with Bitcoin including speed, security, scalability and energy consumption which are all standing in the way of mass adoption. Bitcoin Latinum is a hard fork of Bitcoin, meaning it used the foundation of the Bitcoin blockchain and enhanced the code in order to create a cryptocurrency with higher security, increased transactional speed, higher reliability, and lower transaction costs.

And how exactly is this achieved? Bitcoin Latinum uses an advanced Proof of Stake (PoS) mechanism. Bitcoin Latinum holders earn rewards for holding their coins as collateral to stake on the Bitcoin Latinum network. Essentially the stakers become the validators of the transactions on the network and the transaction fee on the network is divided among the validators relative to the amount they stake. 20% of the fee is shared with the validators and the rest of 80% is reinvested into the network, which is again beneficial for the validators who have locked Bitcoin Latinum to the network, Investing back to the network in this way means the token will grow in value over time.

Mining in this way means that there is no heavy computing power, hardware wastage and high energy consumption such as is the case for mining Bitcoin. The energy efficient community-based consensus on the network also means that Bitcoin Latinum is able to reduce the size of a transaction and increase the transaction volume capability. This means the network can facilitate more transactions per minute, at lower transaction fees. Bitcoin Latinum's PoS structure is projected to be able to process over 10,000 transactions per second with a confirmation time of 3 to 5 seconds. This is a vast improvement compared to Bitcoins current rate of 6/7 transactions per second and confirmation time of 10 minutes. Would you wait 10 mins to make a purchase in store? Probably not. Transactions need to be fast to be usable in the real world and the Bitcoin Latinum is banking on this idea.

The founder of Bitcoin Latinum is Dr. Donald Basile, an entrepreneur and venture capitalist who has been in the



Dr. Donald Basile, Founder, Bitcoin Latinum



crypto and blockchain development space since 2016. The idea for Bitcoin Latinum came about in 2020 when a number of clients approached his firm Monsoon Blockchain corporation wanting a unique crypto solution for media and gaming use cases, one which was secure and could be used for low-dollar value transactions.

Dr Basile shared with us that, " The crypto space hasn't been able to find a solution around retail transactions or lowdollar transactions, like of a few dollars to a few hundred dollars. There is a huge opportunity for a currency like Bitcoin Latinum to grow, one that can be used for small transactions, like in-gaming payments, retail transactions. We expect Bitcoin Latinum to disrupt the crypto space, that is currently void of a currency that is faster, inexpensive, and has an asset backing approach as well as a network effect from usage. Furthermore, we believe consumers will increasingly demand a green currency that is not environmentally harmful."

Bitcoin Latinum are targeting the high growth markets of Media, Gaming, Cloud Computing and Telecommunications and have a range of partnerships underway to expand their reach. They launched the world's first Bitcoin enabled NFT platform in partnership with UnicoNFT. UnicoNFT is a multichain marketplace to create, sell or buy digital arts exclusively using Bitcoin and Bitcoin Latinum (LTNM). They also have a celebrity partnership with three-time Grammy-nominated recording artist Quavo of Migos for the launch of the Cyber Yachts NFT Collections also offered on UnicoNFT. Bitcoin Latinum intend to install 100,000 crypto ATMs across all fifty states of the United States as part of their plan to make crypto easily accessible for everyone and increase adoption of the currency. And they are already partnered with the ten top exchanges too.

Bitcoin Latinum boasts a unique combination of improvements on Bitcoin and even Ethereum, whilst still promoting a DeFi network that facilitates secure transactions. They are certainly one to watch as they set the standard for the future of crypto innovation to be more sustainable and pave the way for increased crypto adoption and utility.

MAKING MONEY IN THE CRYPTO-VERSE:

There are several key means to make money in the crypto-verse.

- 1. Investing and Trading cryptocurrencies and crypto assets. Most people you know who are "in Crypto" are investing in cryptocurrencies (either Bitcoin or Alt-Coins) and participating in cryptocurrency speculation. Like the general stock markets around the world, the objective of the game is to "Buy Low, and Sell High". For day-traders, though the volatility of the cryptocurrency market is very high compared to traditional markets (read high volatility as high risk), high rewards can also be found within volatile markets. That said, crypto assets have tremendous long-term potential for growth; thus are well-suited to a "buy-and-hold" strategy. Most investors agree though: invest money you're willing to place and forget about for while; and don't invest anything you're not willing to lose - as "crypto winters" tend to last years, not months - and there's always a risk that your bet, wasn't the right bet. If you're interested in investing and trading in crypto, you will also have to consider what platform(s) you will signon to. Different trading platforms have different transaction or 'gas' fees, which can vary significantly. Different trading platforms also sell varied alt-coins. You may not find your favorite coin to purchase on one platform, but find it on another. Different platforms also may require payment of those transaction/gas fees in different cryptocurrencies like Ethereum or Solana. This should be researched before signing onto different platforms where trial-and-error may cost you.
- 2. Crypto Staking and Lending. Staking is a way to "validate" crypto transactions in the blockchains with a "Proof of Stake (PoS)" protocol. When you stake, you essentially lock coins in a crypto-wallet, and a PoS network uses your coins to validate transactions. To reward stakers for loaning their coins to the network, the network rewards you in more coins. The concept is not dissimilar to earning "interest" at a bank for leaving your money in a savings account (which then the bank can use to invest or distribute loans where the bank will make more money on). The difference is, instead of earning 1-2% interest at the Bank, staking your crypto coins can earn you up to 20%! Note, like with every other strategy some research is required if you wish to partake in staking. Some trading platforms have this functionality built-in, while others do not. Alternatively, there are staking-specific wallets and applications that can be downloaded and utilized.
- 3. Participate in "Mining" to earn coins by validating transactions through those blockchains that use a "Proof of Work (PoW)" protocol, which requires miners. If you have the adequate super-computer power to mine efficiently, winning miners are rewarded in crypto-tokens.
- 4. Launch your own Crypto-Asset: Create your own blockchain or cryptocurrency and launch it through an Initial Coin Offering (ICO). Similar to an Initial Public Offering (IPO), if you can convince enough investors to buy your ICO, millions and in some cases billions of dollars have been raised with just a whitepaper on your project and a website. Because ICOs are currently unregulated, there have been many fraudulent cases and scams where millions of dollars were run away with after an ICO that went dark. Another way to launch your own crypto asset, is to launch your own NFT and sell it. More on NFT's later in this report.



Cryptocurrency mining has been a hot topic in the crypto space, often credited with forcing government to look at regulating the crypto-industry sooner than they would have, had "crypto mining" not existed.

Mining difficulty peaks in may 2021. At least 13

vears of typical household

electricity is consumed

per mined coin

12 Years

The problem lies in the energy intensiveness of crypto-mining, which is the process used to validate the blockchain ledger in the proc6-6-work (PoW) consensus, used by the Bitcoin blockchain, which in turn rewards the miners with Bitcoin. And with Bitcoin being the most expensive cryptocurrency (1 BTC = US \$46,000 on 1 January 2022) on the market, combined with making up roughly 40% of all cryptocurrency market capitalization, Bitcoin mining is a lucrative and major business activity around the world today. If you don't want to pay \$46,000 USD for a Bitcoin, then the only way to "earn" Bitcoin is to mine it at a more efficient cost.

Mining has only become more lucrative since Bitcoin climbed from \$30,000 at the beginning of 2021 to \$63,000 at its peak in November 2021. If your electricity bill to mine one Bitcoin can be kept below the cost of one Bitcoin, and you can get your hands on a competitive Bitcoin mining rig (a highspeed computer system which can cost you anywhere from \$1,000 to over \$20,000 each), then it makes sense to get into the mining business. But as the NY Times summarizes in their article "Bitcoin Mining Uses More Electricity Than Many Countries. How Is That Possible" (September 2021), today's bitcoin mining operations are major data centers, with heavy duty computing equipment that would utilize 9 to 13 years' worth of electricity to mine a single Bitcoin (approximately US\$12,500 for 1 BTC in New York State). Financially, your profit margin is substantial, if you are spending \$12,500 on energy plus several thousand dollars on a mining rig, so long as Bitcoin remains priced above \$20,000 USD it is likely worth the hassle; especially as winning against all the other miners and validating one block of bitcoin transaction, which happens roughly once every 10 minutes, rewards the winning miner with 6.25 bitcoins - each bitcoin which was valued at anywhere between \$30K to \$63K in 2021.

years' worth. (Put in terms of typical home

electricity bill: about @12,500.) Value of

one Bitcoin today: about \$50,000.



Amount of household electricity required to mine one coin: **a few seconds'** worth. Bitcoin's Value: basically nothing.

Source: NYtimes

Bitcoin's price skyrockets. it now takes years of household electricity to mine one coin despite better hardware The only practical way Enthusuast build of mining is now with custom miner with specialized hardware video gaming (called ASICs) hardware A desktop computer could mine with little electricity 3 6 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021

Note: Actual electricity use would have been higher because of less efficient machines and the need for cooling systems. Electrical usage is compared to the average annual electricity consumption for a U.S. residential utility customer in 2019 of 10,649 kilowatt-hours.

It's no wonder analysts have valued the global crypto hardware market (just the hardware!) to grow by an additional US \$2.8 billion between 2020 to 2024, amounting to be a US \$4.5 billion industry alone. Today, most Bitcoin mining machines are highly specialized, live in big spaces – like glant data centers – with enough cooling power to keep the hardware running constantly without overheating. On top of that, because Bitcoin Mining is a race with only one winner, everyone wants the newest and most powerful hardware – leading to the generation of significant e-waste. Just think of all the miners that are using electricity and computing power every minute to validate the Bitcoin blockchain, 24/7, whether they win or lose out to a more powerful rig. It isn't just the winning rig that is working hard to unlock those Bitcoin rewards, spending all that computational energy, that money on their energy bill to fuel their rigs and their cooling systems. This is what makes the Proof-of-Work consensus mechanism expensive and inefficient.

From an environmental and a resource-limitation point of view though, crypto-mining is just obscenely wasteful. The Bitcoin mining industry uses 91 terawatt-hours of electricity annually, more than the total electricity used by the single nation of Finland, with a population of 5.5 million. It's also more than 7x the amount of electricity used by Google's global operations! That amount of electricity, which constitutes 0.5% of total global energy usage today, has increased by tenfold in just the past 5 years, and analysts fear it will only get worse. Such inefficient use of electricity for miners to get rich, doesn't sit well with a lot of people.



AVERAGE YEARS OF HOUSEHOLD-EQUIVALENT ELECTRICITY TO MINE ONE BITCOIN

Using the most efficient hardware available at the time

China's September 2021 decision to ban cryptocurrency altogether and make anything crypto-related a crime, is thought to be strongly driven by the unit economics of the energy intensiveness of crypto-mining. China's commitment to reach its peak carbon emissions by 2030 and to go carbon neutral by 2060 is a key ambition for this aspiring world leader, and was clearly being threatened by China's Bitcoin mining industry. China once housed up to 75% of all global Bitcoin mining operations, but Miners were swift in relocating their operations. Miners moved to the cheap-but-troubled Texas electricity grid (the US is now home to 35% of all Bitcoin mining operations), the coal-rich and cheap electricity grids of Kazakhstan (18%) which produce nearly 90% of its energy via fossil fuels, and to Russia (11%) which has 60% of its electricity mix generated from fossil fuels.

The USA was a natural relocation destination for mining operations for a few reasons. First and foremost, Texas has some of the cheapest energy in the world; fortunately, Texas leads the US in wind-powered generation and produced 28% of the country's wind power electricity in 2020. In addition to cheap electricity, there was a sizeable supply of turn-key mining infrastructure in the country built-up by many deep-pocketed investors who had quietly accumulated and built crypto mining sites across the country during the less-expensive crypto winter years; this made it easy for crypto miners to spring-up overnight in 2021 as Bitcoin's price surged.

Russia legally recognized cryptocurrencies in 2020, but soon after banned their use for transactions. In January 2022, Russia's Central Bank released a report proposing an all-out ban on both crypto mining and crypto trading, citing threats to financial stability, citizen's wellbeing and its monetary policy sovereignty (more on this in the regulatory chapter).

Kazakh officials are working to crack-down on "illegal" and unregistered bitcoin miners working in the country without the necessary permits, but seems pro-crypto for the time being. The power of the Kazakh mining operations was felt worldwide in January 2022 when civil unrest in the country had the government implement a nation-wide internet blackout, which stopped mining operations for days. This in turn sent the price of Bitcoin down, as nearly 1/5th of its miners went offline in one fell swoop. In other countries, like Iran, the surge in demand caused by crypto miners was so great, that the grid failed, causing power outages across the country. As rolling blackouts spread throughout the country, Iranian officials were forced to ban crypto-mining for periods of time (in both the heat of summer and the middle of winter) when HVAC warming and cooling units in homes and industry would put more pressure on the grid. Iranian officials have stated that licensed mining operations have gone through the checks and balances, but many of the illegal mining operations are the ones that are not energy efficient in the country, and they seek to shutdown these illegal operations.



SPOTLIGHT | AROWANA

RENEWABLE ENERGY POWERED CRYPTOCURRENCY MINING

AROWANA

Arowana is an award-winning global B Corporation group that has several operating companies and investments in electric vehicles, renewable energy, education, technology and software venture capital, and impact asset management. They founded VivoPower International in 2014, a next generation sustainable energy solutions company who own solar power projects throughout the US. Their latest new business is **Caret Decimal**, an exciting venture that is taking on the task of mining cryptocurrencies with renewable energy.

Caret Decimal's mission is to be the 'most efficient vertically integrated, green-powered cryptocurrency mining company in the United States with the lowest breakeven cost of mining.' They expect this cost to come in at less than \$4,500 USD for each Bitcoin mined, which would indeed place them in the lowest quartile globally (USA average sits at \$12,500 USD). They are combining low cost of power with the efficiency of their mining rig fleet and the implementation of performanceenhancing solutions such as state of the art cooling systems to make this happen.

And VivoPower are more than familiar with large scale renewable power creation, particularly solar power, having worked on the development of around 2 gigawatts (GW) of solar projects since 2015 - including projects across the entire development cycle, from construction to operation. We spoke to Kevin Chin, the Chairman of Arowana, Founder and CEO of VivoPower who told us, "Our strategy in relation to our portfolio is to develop and build vertically integrated renewable generation infrastructure that will underpin 'Power-to-X' (P2X) applications. P2X involves converting renewable energy into another product (being the X) other than electricity for the grid. Typically, the X would be the output of highly energy-intensive industries such as cryptocurrency mining, green hydrogen, ammonia, and desalinated water."

VivoPower analyzed the multiple P2X use cases and realized that renewable-powered cryptocurrency mining represented the best use case. And in order to accommodate the growth in crypto mining, they believe there needs to be corresponding growth in renewable power generation to not only maximize profitability but also to avoid any socio-political and regulatory issues. Such as the issue in Iran where crypto mining has put so much pressure on the country's energy grid that it has been banned for periods of time in order to free up power for households.

Kevin went on to add that, "Caret Decimal's business model will be that of a cryptocurrency miner with its own captive source of low-cost renewable power, enabling it to become one of the world's lowest cost digital asset miners. So, we are not simply a vendor of renewable power purchase agreements (PPAs) to crypto miners, nor are we just a hosting provider with our own infrastructure."

The intention is to primarily mine Bitcoin with a dedicated miner fleet, which also has the flexibility to mine Litecoin. They are also evaluating allocating a portion of available capacity to other types of miners that excel at mining other tokens such as Ethereum and Monero, where profit margins can be even higher.

Outside of the US, the company has also taken an interest in this region, which makes sense given that the Arab Peninsula ranks amongst the top globally for solar insolation (the amount of solar energy that reaches the earth surface over a specified period of time). VivoPower established a subsidiary in the UAE last year, having been impressed with the progressive policies towards blockchain and crypto. They are now in the process of building out a team in the region and are pursuing several opportunities in the UAE and the surrounding markets.

The long-term vision for Caret Decimal is to be one of the world's leading companies empowering sustainable blockchain adoption whilst also meeting the UN SDGs (Sustainable Development Goals) in the process. This will mean building capability in not just cryptocurrency mining but also content generation and smart contracts too.

And this is just the start of the possibilities, as Kevin shared more on what the future could look like:

"An emerging perspective that we subscribe to is that Bitcoin can practically operate like a battery, in that it converts electricity into a financial security with economic value. Conventionally, a battery is basically any device that converts chemical energy into electrical energy, which includes the current generation of lithium batteries. Indeed, there are arguments that Bitcoin is a better battery than lithium, given that its storage is free, and it does not leak discharge over time. Monetizing Bitcoin is a lot easier than monetizing stored solar or wind energy.

Companies such as Aker Solution's subsidiary SeeTee, Blockstream, and Soluna are already building businesses around this notion of Bitcoin as a load-balancing economic battery. We see an opportunity for Caret Decimal to contribute to the evolution of what could be a virtuous cycle where mining Bitcoin helps to solve intermittency—a key problem with renewable power—and in turn, the economic value created, stored, and monetized in the form of Bitcoin can be re-invested to drive further net zero cryptocurrency mining and other blockchain applications. "

It is a big year for the company as they expect to commence mining at a partner-hosted site and have their renewable-powered integrated cryptocurrency mining facility in Texas to be fully operational by December. Over the next two years, they plan to develop at least three solar sites with corresponding cryptocurrency mining facilities. Arowana has a long-term commitment to building strong, sustainable businesses that will have a positive impact on economies and we expect that VivoPower alongside Caret Decimal will deliver the same in the crypto space.

For more information, check out www.arowanaco.com

Kevin Chin, Chairman, Arowana



WHAT IS **Defi?**

DeFi stands for 'decentralized finance'. It's an emerging fintech class of solutions and companies based on secure distributed ledgers similar to those used by cryptocurrencies.





Consumers using DeFi products and solutions hold their money in a secure digital wallet instead of using a bank, eliminating the numerous fees charged by banks and other financial institutions in the traditional banking system for holding an account or executing transactions. Not only is DeFi solutions cheaper, but the actual transfer of funds occurs within seconds or minutes – anywhere in the world, instead of hours and days we are accustomed to in the traditional banking system today. It's a solution that is open to anyone with an internet connection, and does not require approvals.

The philosophy of DeFi is at the heart of the blockchain and crypto-craze, in that it removes the control that banks and institutions have on money in the current traditional system. In centralized finance, your money is being held by banks and corporations that are ultimately looking to make profits. Translation: the centralized finance system is riddled with service fees between all the stakeholders, visible and hidden. For example, when you use your credit card to buy your groceries, there are associated fees between the merchant (grocer), the acquiring bank, and the credit card network. DeFi and a decentralized financial system allows for a peerto-peer financial network based on blockchain technology. Regardless of where you are in the world, so long as you have an internet connection, you can lend, trade, and borrow using software that records and verifies transactions based on a distributed financial ledger system.

DeFi doesn't mean that there are no fees associated with the transaction, but that there are more options, and often less expensive options than traditional finance, for the consumer. Transaction fees in the DeFi and crypto world are calculated in a fraction price of the token used to complete the transaction on such a blockchain. The tricky part about DeFi blockchain transaction prices, the most widely-adopted being Ethereum for dApps (decentralized apps, like DeFi), are not fixed. The amount of gas required for each transaction depends on both the supply and demand of the network's miners for Proof-of-Work blockchains and the complexity of the transaction. Thus, smart contracts have peaks of high demand; as a network gets busier, so does the price of its native asset - and thus the transaction fees also climb. This can be seen on the graph above which illustrates transaction (gas) price variations on Ethereum's blockchain over a 14 week period.

Crypto-enthusiasts tell us that DeFi is completely different to Bitcoin; while buying cryptocurrencies like Bitcoin is comparable to buying and holding gold and silver, DeFi is comparable to picking stocks, because every token represents a different business, complete with new business solution, business model, team and business plan. The world of DeFi is made up of enterprises that have crypto-enabled businesses and governance models. Here, we highlight a few players to illustrate the DeFi ecosystem.

SPOTLIGHT | @PAY

A dApp AT THE CROSSROADS OF DeFi, BNPL & CRYPTO TO FIAT (C2F)



Founded in August 2020, @Pay (AtPay.io) is a new kid on the block, as crypto start-ups go – and in fact, has yet to launch officially – but the multipronged business model being touted by the DeFi platform is turning crypto-heads in anticipation.

@pay

@Pay is a Buy-Now-Pay-Later (BNPL) DeFi protocol built on two blockchains. It will connect shoppers with the provision of short-term credit where they can make repayments in structured instalments over three months and get rewarded with @Pay governance tokens when they complete repayments. BNPL start-ups are nothing new; they have become a mega-trend in the global fintech ecosystem, with start-ups springing up all over the world in the past 5 years looking to replace credit cards for a new generation of consumers. But what makes @Pay unique, is that it is currently the only BNPL fintech solution that is built on a blockchain that will also provide users with the ability to make payments in both normal flat currency as well as cryptocurrencies.

For crypto-junkies, the ability to have a flexible BNPL application that allows interchangeable payments in either fiat or cryptocurrency is a major step in the right direction - as the industry requires more integration apps that bridge the "crypto world" with the "traditional world" in order to achieve greater crypto-adoption. For Investors, running a BNPL application on a blockchain makes intuitive sense; as the blockchain, in theory, should allow for significantly reduced transaction costs, thus increasing profit margins compared to traditional BNPL players. This is an important aspect of the business case that @Pay is proposing; in co-founder Omar Diab's words: "It is important to note that none of the world's big three standalone BNPL firms are currently making a profit. We believe a comprehensive smart contract framework built on fast and cost-effective blockchains is the only



way a provider can scale and turn a profit. @Pay is being built on the Algorand and Solana blockchains, both of which are emerging as the main global standards for speed and real world transaction cost efficiency. It is clear BNPL as a standalone business is probably not viable based on current figures published by the main companies. To illustrate this point, traditional BNPL companies rely on payments from retailers of around 3–4% of the cost of goods sold using their platforms; when you add in the cost of marketing, bank interchange, network fees, issuer processing fees, credit losses and funding – there is little left for the provider. We believe this is why none of the big 3 BNPL firms are profitable today, and this is where @Pay can help."

When asked about regulation, co-founder Adam Mazzaferro states: "While the lack of regulation has helped BNPL firms grow rapidly and keep costs down, it is inevitable this will change as has been seen as recently as this month with the Australian Government announcing it is considering measures to formally regulate the BNPL space. In developing @Pay we have always factored in some form of Government regulation coming into play. Combine greater regulation with a rise in the cost of funding and traditional BNPL firms are set for more pain, this is why we have been developing a new approach which we see as the only alternative." The app is also powered by their own token called @Pay governance tokens which are rewarded to users when they promptly make repayments for their purchases. The @Pay governance tokens can be redeemed to up user's credit limits from \$250 all the way up to \$1,200 over time. The tokens can also be used to buy products from merchants on their platform, and voting on certain outcomes that can shape the future of the @Pay ecosystem. Finally, the platform will also allow users to stake 10 pre-approved cryptocurrencies that they are stable coins, which will contribute to the platform's lending pool.

BNPL platforms alone are exciting enough around the world, as we see a dramatic shift away from credit card ownership towards BNPL app downloads. Add the hybrid fiat and cryptocurrency digital payment functionality, and things get a bit more exciting, especially as the pandemic surged the number of crypto investors. It is estimated that approximately 3.9% of the world owns cryptocurrencies, with over 300 million crypto users around the world. There are an estimated l million crypto users in Oceania (Australia & New Zealand) alone, where @Pay is born and based – though the cofounders stress that their business-model is global.

Mazzaferro and Diab come from corporate law and investment

SPOTLIGHT | @PAY

banking (derivatives trading) backgrounds, and have been friends and colleagues for over 20 years. Having closely followed the BNPL market trends in recent years, which is especially strong in Australia, coupling that with the cofounders' mutual interest in blockchain technologies, crypto, and DeFi applications – the two felt that there was space here to merge two strong concepts together.

"Lastly, we would be remiss not to mention our API development," adds Diab. "Our API will help facilitate a symbiotic relationship between our partnerships and customers. Partners will be able to reward their customers upon the completion of repayments. This development will allow @Pay to immediately access the multi-billion dollar BNPL market. We believe in this incentivized offering model. Even other BNPL platforms will earn rewards for partnering together with us, the same way customers will receive rewards for paying off their loans on time. Any BNPL platform that agrees to engage and utilize the API can expect a commission split arrangement that will be negotiated on an individual basis. In this sense, we are positioning ourselves as a global solution to support existing BNPL companies, not just another BNPL competitor."

The project has been entirely self-funded to date, and @ Pay's beta testing is expected to be completed at the end of Ql 2022 with completed integration of Solana and Algorand blockchains, and a pilot launch expected shortly thereafter in Australia and New Zealand. The co-founders are also currently in talks to explore launches in the USA, Canada, the UK, various EU markets and India within their first year of operation. Vietnam, Singapore and the GCC region are also target markets, based on considerable interest coming from these territories. Their year one targets include a strong focus on continuing to develop and build strong strategic partnerships where there is a natural fit, such as introducing their product as a payment gateway solution on various platforms such as NFT marketplaces and online gaming platforms, in addition to traditional retail and e-commerce spaces. The team would not comment on specific partnerships being signed, but say they have received considerable interest from a long list of merchants waiting to participate in the Beta Testing pilot about to launch. Many will be watching Atpay.io closely as they launch - not just from the crypto space, but from the BNPL and fintech space. They make a compelling case, but as with every project yet to launch - their success will entirely depend upon their implementation and execution when the rubber hits the road.



SPOTLIGHT | COINOVY

A ONE-STOP WALLET SOLUTION FOR EVERYDAY CRYPTO-USERS





Coinovy is a multi-purpose digital financial platform, that enables customers in more than 150 countries to manage all their crypto needs in one place. Users can send, receive, exchange, earn, store, buy, and cash-out the most popular cryptocurrencies on an easy-to-use app. It offers an all-in-one wallet system on which transactions are settled in a speedy time of less than 60 seconds. And what's more, it is a multicurrency wallet, so users don't need multiple different wallets to store their digital assets.

Coinovy provides a bridge for the crypto and traditional economies by enabling accessibility, security, and liquidity. Their mission is to offer 'simple, transparent, and speedy transactions within an ecosystem that has been created to give people the power to move digital value securely through the traditional or crypto worlds.¹ It offers features that put beginners' minds at ease in terms of how to use crypto in everyday life and how to keep digital assets safe and secure. It does this by allowing users to withdraw cryptocurrency to a Coinovy VISA debit card which can then be spent in local flat currency at any location that accepts VISA. It can even be linked to Apple Pay, making payments even more convenient.

Coinovy also gives users an International Bank Account Number (IBAN) which makes cross-border transactions seamless and easy for users to transfer funds across the globe. Users can even get a loan up to \$5000 with 1% interest, using their cryptocurrency as collateral on Coinovy's platform.

When it comes to security, Coinovy partners with BitGo, an international leader in institutional digital asset custody. So, any stored crypto is protected by BitGo's Digital Asset Insurance of \$100 million and can compensate users in cases of security threats or losses.

Although it is designed to make entry into the crypto world as easy as possible, Coinovy has plenty of advanced capabilities for experienced crypto users too. One of the most touted features is the Prediction analytics tool which is available as an add-on subscription. This provides users precise forecasting for predicting crypto coin movements and blockchain dynamics. The AI algorithm tracks more than 150 assets and boasts an accuracy of over 90%.

Coinovy also functions as an exchange platform by letting users buy, sell and swap cryptocurrencies. They have 100+ exchange pairs accessible instantly, which means users can choose to swap coins for other types of available coins or withdraw into any bank account globally.

The platform is powered by its own native utility token called C2F which is deployed on the Ethereum network and is compliant with the ERC20 token standard. It is used to reward users for their contributions and is a means of payment. While other currencies are accepted as payment for all operations on the platform, holders of C2F will receive a discount. The platform even allows for token staking (locking in tokens to receive rewards) which provides an alternative way of earning for users who prefer not to trade.

There are two features in particular that make the platform unique: CryptoBridge and Token 2 Coin (T2C). Coinovy provides a bridge, or a connection for the ability to trade on different blockchain ecosystems. A bridge is important in order to allow for interoperability – for transactions between two distinct blockchains to occur. The Coinovy CryptoBridge is between two of the world's leading blockchains – Binance Smart Chain (BSC) and Ethereum, so users can get the best of both blockchains by essentially choosing to trade on the blockchain that gives the fastest transaction time and the most lucrative liquidation of their crypto-tokens.

Token to Coin (T2C) is the other pioneering feature that provides the option of exchanging tokens with coins. This means that new token companies can list on Coinovy, and their token holders can get access to liquidate and utilize their products. With security provided by BitGo and simple fund access through Visa Debit Card, these companies are also enhancing their brand by building upon the high credibility and trust of Coinovy.

Coinovy is trying to become a one-stop-shop when it comes to cryptocurrency trading and spending, and they are certainly solving the issue that many crypto users complain about having to visit different platforms for different services. Coinovy want to simplify fintech. They want to attract the masses into the crypto space as well as giving bank like features to people without bank access. Given that around 1.7 billion¹⁶ adults globally do not have access to financial services, this is something that crypto has the potential to change. To this end, Coinovy is currently partnered with United Africa Blockchain Association (UABA) to help promote crypto adoption throughout the region.

Coinovy was founded in 2019 by Sai Tej Annareddy along with co-Founders, Dhaval Parekh and Bhavin Kachalia who have brought together combined 45 years of varied experiences covering everything from custom blockchain solutions, running & managing a blockchain and crypto company, to AI, FinTech and digital marketing.

It is interesting to note that Coinovy is looking to be not only to be B2C focused, but also a B2B solution provider through bitium.io, its own desktop crypto wallet. This feature is already launched for businesses who are now interested in accepting cryptos and increasing their user base.

When it comes to global digital asset compliance, Coinovy are not only prepared but welcome regulations. Features such as IBAN's are only available to users after they register and complete Know You Customer (KYC) details. Sai Tej has said that "Coinovy is not here to challenge the current financial infrastructure, but we are seeking every possible way to connect with the existing infrastructure, such as banking, payment solutions, and governments by integrating crypto into it. We are believers in DeFi, but with a cap and a check on it."

Coinovy could very well be what the crypto world is looking for, an all-rounder, nearly all in one solution which makes the crypto ecosystem more accessible and functional to everyone across the globe.



¹⁶ World Bank, "Financial Inclusion Overview" (October 2019)

WHAT ARE **NFTs?**

NFT's stand for "Non-Fungible Tokens". "Non-Fungible" basically means that these items cannot be replicated or replaced with something else; it can be anything in digital form, from art, animated GIF, a song, music videos, digital avatars or avatar skins, or video games. NFT's can also be "one-ofa-kind" (like the Mona Lisa painting hanging in the Louvre) or a copy of many (like collectible baseball cards).

The unique selling point of NFTs is that NFTs uses blockchain technology, mostly the Ethereum blockchain, to establish proof of ownership through a public digital ledger, so that ownership is transparent and secure.

Essentially, NFTs are collectable digital assets that hold value, with transparent and secure ownership locked into a digital ledger. Buyers of these works get the privilege of "owning" a piece of digital art. The artwork typically comes with a license that allows buyers to display them for personal use on a social media page, another digital marketplace, in a game world, or in a virtual museum. You might have a digital "copy" or reproduction of that same digital art, but you won't have the original copy that is listed on the public ledger. The artists generally maintain intellectual and creative (IP) rights to the works. Many argue, then, that what buyers are really buying, is "bragging rights". But it seems these bragging rights are going for some major sums in 2021.

- Christie's auction house in New York city sold a NFT by Beeple titled "The first 5,000 days at Christie's" for a whopping US\$69.3 million in 2021, which is a digital art piece of a collection of 5000 Beeple art works in one image. This was the 3rd highest price ever paid for a work by a living artist.
- Adidas sold all 29,620 of its own NFTs in December 2021, at a cost of 0.2 ETH (or roughly US \$765 each), grossing the company a cool US\$22 million in a few hours; it was a digital NFT paired with physical clothing to match, to be distributed to buyers in 2022 – an expensive pre-order of sorts.
- Jack Dorsey, the CEO and founder of Twitter, sold his first tweet as an NFT through an auction for US\$2.9 million in March 2021.

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jack (@jack	6		
just setting		ttr	
♡ 173.3K		S Copy link to Tweet	
		Read 10.1K replies	

Despite NFTs leaving many scratching their heads trying to understand what makes them so valuable – marketplace activity seems to indicate that NFT's are here to stay. In December 2021, Nike bought RTFKT, a virtual shoe company that makes NFTs and digital sneakers for the 'metaverse'. In December 2021, Marvel announced that it will be releasing a Captain America themed NFT collection, after its successful Spider Man NFT launch earlier in the year. The NBA (National Basketball Association) came out with its own NFT collectibles platform, NBA Top Shot, housing thousands of digital collectibles, such as video clips of memorable moments on the court that you can purchase online today. NFT "digital moments" can currently be purchased in USD or Etherium (ETH).

Before you dismiss NFTs as a laugh-and-grab of the rich, note that there are also real-world applications to NFTs, beyond that of the metaverse application – and many which have not been invented yet. Nike for example, the world's largest shoemaker, was awarded a patent for its blockchain based sneaker, called "CryptoKicks" in late 2019. The patent outlines a system in which blockchain is used to attach cryptographically secured digital assets (ie. NFTs) to a physical product, such as a sports shoe. It seems that Nike's platform will track the ownership and verify the authenticity of both real-world sneakers and virtual sneakers using this method. This way, sneakers can be sold and ownership transferred through the associated digital asset. It leaves some food for thought, especially as the fashion world has struggled for years with combatting counterfeit and fake products. The cryptokicks.com marketplace has launched, with the sneakers purchased able to be worn by some gaming avatars. The kicks are purchased using Solana (SOL) tokens.

NFTs also seem to offer significant promise in other spaces, such as proxy for membership or tickets to physical events. Applications like 'Unlock' allow users to purchase an NFT which unlock membership to an ad-free version of the Forbes website, for example. NFTs can also be tied to physical goods, such as in the case of Nike's Cryptokicks, or Austria's Postal Service's 'Crypto Stamp' project tying their digital NFTs to physical stamps for use, trade or collection.

Gaming is one of the most pro-NFT industries out there, where gamers have supported NFTs since they were a fringe concept. Gamers would buy NFTs that cosmetically changed their gaming avatar's appearance (called skins), or buy NFTs that gave them special skill-sets that could help them get further in a specific game, or even access to unique and often hidden player experiences within a game (often called Easter Eggs). There's an entire new industry launched off the back of the NFT-Gaming space, called "Scholarships" – a way for players to become crypto-landlords and rent-out their NFTs used in games as tools, creatures or skins. In return for getting the NFT loaned to them, the Gamer then provides a cut of their earnings while gaming to the NFT landlord. And this is clearly just the beginning.

It's also expected that the Metaverse will allow NFT owners and creators to showcase their collection in a digital world. NFTs can also be created for the metaverse, such as carving out land in the metaverse and selling it. Or designing a custom Lamborghini for the metaverse, or a custom skin for your metaverse avatar – and selling it as an NFT. Technically, all of these things can be digitally designed and sold as NFTs, that should be able to be used, showcased or traded in the metaverse.

Many also argue that NFTs are more about the "creative community" and directly supporting artists and content creators for their contributions, not necessarily the specific image or art itself. There seems to be a very alive and active online NFT community that connects artists and their patrons, and allows a discourse between the two – often only after purchasing one of the NFTs. Sometimes owning different NFTs helps to unlock these channels, whether it's direct access to communicate with the artist, or to join an online fan club of sorts.

SPOTLIGHT | ICICB

ICICB, AN INVESTMENT MANAGEMENT COMPANY BETTING BIG ON THE WORLD OF CRYPTO, BLOCKCHAIN, AND THE METAVERSE

The world around us is changing at a faster rate than it has ever done before. There are major breakthroughs at every phase, and what was once deemed impossible is now the norm. ICICB is a global investment management company that primarily focuses on funding breakthrough projects that will shape tomorrow's future, which is why the company has several investments in blockchains, cryptocurrency-related projects, and the Metaverse. The company now holds multiple licenses in FinTech, blockchain, digital banking, crypto exchanges and hedge funds, as well as in medical and other more traditional industries. ICICB holds 24/7 presence in 26

countries with 114 offices and 52 subsidiaries. ICICB is now worth more than US \$2.6 billion and manages US \$10 billion in assets, just three years after its inception in 2019.

The group also has launched several projects internally in the crypto-space, including the ICICB Blockchain. It's a secure, fast, and highly scalable blockchain, laying the foundation for the emerging industries of AI, Gaming and the Metaverse. It uses emergyefficient proof-of-stake and

Segwit protocols. Segwit is one of the key elements that sets ICICB's blockchains apart, as Segregated Witness (Segwit for short) is the process of increasing the block size on the blockchain by removing signature data from transactions. When certain parts of the transaction are deleted, space or capacity is freed up to add more transactions to the chain. ICICB's blockchain will utilize the deterministic master node list, a structured form of master nodes derived entirely from chain data. This introduces new transaction structures and allows the network to register and update master node is from the chain. As other nodes derive their master node lists from these on-chain transactions, all nodes will reach the same consensus on the current effective master node list. According to ICICB, the above-mentioned crucial modifications in the development of the blockchain will enable it to efficiently process 30,000 transactions per second, making it one of the world's fastest blockchains, to date. Though there are a handful of blockchains that have zero transaction fees (i.e. Nano), ICICB's blockchain's transaction fee is nearly negligible at \$0.0000008 per transaction. This would put ICICB's blockchain, once launched, as one of the fastest and lowest cost blockchains out there.

ICICB envisions developers using its blockchain as the base infrastructure from which DeFi, Fintech and decentralized apps (dApps) are launched.

	BLOCKCHAIN	SPEED: TRANSACTIONS Per second (TPS)	TRANSACTION FEE (PER Transaction)
	Solana	50.000 着	\$0.00025
	ICICB	30.000	\$0.000008
	Bitcoin SV	2.800	\$0.00055
5	Ripple (XRP)	1500	\$0.00078
l	Digibyte	560	\$0.0005
	Bitcoin Cash	116	\$0.0024
	Bitcoin	5	\$1.00

Speaking to the Chairman, Airton Arruda, he explains, "we believe that the affordable transaction fees make ICICB userfriendly, particularly when we consider our upcoming gaming and metaverse projects."

Arruda continues, "ICICB Group's vision for the future revolves around providing high-quality products and services based on the use of artificial intelligence, metaverse and blockchain applications. We seek to fund companies that share a similar vision for the future, a more sustainable and decentralized future, driven by innovative people and technologies. That is why Atari and The Luxury Bank are among our investments." The Luxury Bank is a global luxury lifestyle and technology group that provides luxury lifestyle management services to a global clientele. The Luxury Bank plans to launch a decentralized virtual reality (VR) platform that aims to redefine the entire user experience by incorporating augmented reality (AR), VR and blockchain. "It is amongst our first foray into the Metaverse," says Arruda. "Imagine a world where you can meet, shop, work, go to school, play, and be who and what you want, while teleporting or traveling in time whenever you want. We invested US \$10 million into The Luxury Bank to develop 'Luxandia' - a Metaverse platform like Second Life, but with immersive graphics and many additional features. Luxandia is not just a shopping VR platform, but an expansive 3D social realm full of exploration, discovery and creativity."

The partnership with Atari is fueled by that drive for innovation as well. Atari was founded in 1972, establishing itself as a leader in the gaming industry year after year, developing beloved games such as Asteroids, Centipede, Missile Command and Pong. Arruda added, "ICICB's partnership with Atari is not just about crypto. Atari has engaged in a licensing agreement with our group for the development of the Atari-branded Hotels, which was announced on March 10, 2021. The Hotels will have Atari playgrounds, several event spaces, co-working areas, good restaurants and bars, a bakery, movie theatre and gym. It will be one-ofa-kind hospitality, centered on gaming culture, integrating the past, present, and future of gaming entertainment. The design of the hotel targets both business travelers and those seeking pleasure and entertainment by mixing luxury with fun." As for the crypto part of Atari, ICICB owns 50% of the Atari Chain and the Atari Token. Atari Token is a decentralized cryptocurrency created to become a reference token for the interactive entertainment industry. It seems that the Atari token will be used as a means of payment for ICICB-owned virtual world entry and access to new games. Arruda adds, "Our goal for Atari Token is to be used as widely as possible throughout the interactive entertainment industry, providing developers and publishers with new options for exploiting their products, integrating smart contracts, protecting in-game assets and the like."

ICICB is a complex investment management firm, both developing projects in-house, and acquiring

or investing in outside players. The Investment Management firm has big plans for 2022, including introducing its crypto trading app, which will allow users to trade (buy and sell) crypto and utilize it in peer-to-peer payments and transfers. They also plan to mint their own ICICB Coin, along with the launch of a cryptocurrency-powered metaverse casino, developed on their own blockchain. "At the end of the day," Arruda says, "I'll be delighted if in 5 years people see the ICICB logo, and see the company as a firm that makes innovative investments in the future, and for making the most out of the opportunities that present themselves today."





The Crypto ecosystem and the underlying blockchain technology offer decentralization, transparency, and flexibility. It is set to revolutionize and redefine the way we operate, but why are opinions so divided on the right path forwards with regards to regulation? How are different governments approaching this emerging asset class?

On one hand, blockchain technology with its decentralized, distributed ledger means that no single entity can control, compromise, or manipulate cryptocurrencies. It proposes an attractive alternative to traditional finance systems by cutting out the middlemen and providing an open, democratic and decentralised monetary exchange and governance system. It provides both time and cost efficiencies in a world that is looking to save on both time and cost.

On the other hand, decentralization also means that without a central governing authority, there is nowhere for crypto users to turn to when things go wrong, such as in the case of cyberattacks, fraud, or even accidental loss of funds. Exchanges are digital and therefore automatically vulnerable to hackers, ransomware and operational glitches. Essentially crypto currently exists on a non-regulated 24-hour stock market. It is not insured and there isn't any responsibility for monitoring and identifying suspicious transaction patterns. This has brought up questions around how safe and secure these crypto platforms, applications and stakeholders are.

Crypto has been accused of being an ideal breeding ground for illegal activity, associated with money laundering through crypto exchanges, the finance of terrorism and human

trafficking as well as the darknet market. Is the crypto world rampant with illegal activities, more so than the traditional banking system? The traditional banking system seems to be rife with money-laundering and corruption scandals as well - the world's institutional banks were dealt out US\$10.4 billion in Anti-Money Laundering (AML) fines in 202017.

Whilst it is true that the pseudo anonymity of blockchain technology creates somewhat of a data gap, it is a misconception that transactions are untraceable. Compared to traditional banking, blockchain transactions are often more transparent, traceable, and therefore accountable due to the distributed ledger function, making it a poor vehicle for money laundering compared to cash. However, the problem is that although transactions can be traced, specific parties may not be as easy to identify as there are many crypto exchanges that provide their services with no anti-money

laundering (AML) or know your customer (KYC) practices in place

However, data does show that crypto-based crime hit an all-time high in 2021, with illicit addresses receiving US\$14 billion over the course of the year, nearly twice the amount of the previous year. This includes terrorism financing, scams, stolen funds, ransomware and the darknet market. Though crypto-crime has increased in value in the past year, it has gone down as a total share of crypto value in the market;

we must remember that total crypto transactions grew to US\$15.8 trillion in 2020, a 567% increase compared to 2020 levels¹⁸. Comparatively, the annual amount of money laundered and connected with illicit activity globally is 2 - 5% of global GDP (USD \$1.6 to \$4 trillion USD)¹⁹.

CRYPTO SCAMS: BEWARE AND PROTECT YOURSELF

Though the jury is still out on whether or not the cryptoecosystem is more rife with scams than in traditional financial system, investors must be prudent and do their due diligence, just as in any other market. Financial scams and

fraud associated with crypto have also been on the rise for the past 5 years with many coming from 'rug pulls.' This is a relatively new concept where crypto projects are launched and then abandoned by developers who take investors' money, by removing transaction (or trading) ability and draining liquidity from the market by quickly cashing out. Rug pull scams often rely on extensive marketing to attract investors including the heavy use of social media, influencers, and popular culture to promote the project. One recent example was the 'SQUID' coin, marketed as a 'play-to-earn' cryptocurrency, where users purchased tokens to play in online games. Many users believed that the tokens were associated with the hit Netflix show Squid Games and that they could be used for a new online game inspired by the show. SQUID was traded on a decentralised exchange and increased 83000% in just days fuelled by major news outlets running headlines about it. SQUID peaked at \$2681

before crashing to zero and developers are reported to have disappeared with around USD \$3.4 million²⁰.

Initial Coin Offerings or ICO scams are happening too. ICOs are the crypto industry equivalent to IPOs and a popular way for companies to raise money to create a new coin or crypto related service. Yet whilst IPOs have strict legal guidelines to follow in most countries. ICOs simply require a whitepaper. website and an interesting feature or story to entice potential investors. Social engineering scams such as blackmailing,

¹⁷ The Economist, "The war against money-laundering is being lost" (17 April 2021) ¹⁸Chainalysis, "Crypto Crime Report 2022" (6 January 2022) ¹⁹ The United Nations Office on Drugs & Crime, "Money Laundering Overview" (2021)

²⁰ BBC News, "Souid game token collapse" (2 November 2021)

romance scams, and phishing that are already prevalent in the traditional finance world, are becoming increasingly used to trick crypto users into compromising their secure information. Moreover, even when crypto investors try and protect themselves by using exchanges to store their cryptocurrency, they are still at risk from being hacked whether on a centralized or decentralized exchange. There is little support or insurance for such losses today.

This points to the need to protect investors and to create an infrastructure for the industry. If the future of money is crypto and the future of finance is blockchain, then building trust in the system is essential. The market is complicated, inundated with mis-selling and scams due to low investor awareness and education. There needs to be a way that the performance, potential and risks of crypto assets are made more transparent, while monitoring and minimizing the manipulation and illegal activity in the crypto ecosystem.

These are just some of the risks and challenges posed by this 13-year-old industry. Many believe that regulation of the industry will start to solve these issues and ensure its global legitimacy as well as pave the way to mainstream adoption. But, what then, does a good regulatory framework look like?



²¹ Harvard University, "It's time to strengthen the regulation of Crypto-assets" (March 2019)

WHAT DOES REGULATION MEAN FOR CRYPTO?

As the crypto world continues to gain unprecedented level of interest, regulation is going to continue being a major theme for the industry in 2022. This includes establishing security, business regulations, taxation rules as well as consumer protection mechanisms.

As with any new technology, the lack of regulation in the early days was beneficial for the industry, allowing for plenty of new ideas, platforms, experimentation, and rapid innovation. But today, there is a strong case for carefully thought-out regulation for the evolution of the crypto industry. The crypto world is made up of crypto-assets, cryptocurrencies, central bank digital currencies and NFT's each providing a unique set of benefits, challenges, and complexities; thus, this is not, and cannot be a copy-paste exercise of regulation from the traditional financial system – as the same rules and regulations for traditional finance do not directly apply.

There are many important regulatory concerns and considerations that touch every part of the crypto ecosystem. Given it is still a relatively new industry, it is essential that innovation can continue, competition is supported and growth can continue to help it reach its potential. It is critical that regulation minimizes risks, garners trust, and maintains financial stability, without eliminating the benefits of the technology.

When it come to crypto services, it is vital for regulation to consider if they should be allowed to have multiple roles; many of them currently act as a trading platform but also as a broker. How can such conflicts of interest be managed to ensure investor protection? And should the assets be separated with independent governance structures?²¹.

Crypto-users that are keen for some regulation state that effective regulation of the crypto ecosystem will actually allow for more tangible use cases for the technology to be realised and for the technology to create opportunities in all areas of society. Pro-regulation users say it should encourage mass adoption even to the level that companies will begin to implement virtual assets into their operations without fear. Those against regulation take the position that any government control will take-away from original ethos of why crypto was built in the first place: decentralized finance, away from control of any individual or group.

It's a fine line between over-regulation and under regulation and one which Governments around the world are trying to tackle, not least as they also want to now reap the economic rewards of this world changing technology. In recent years, the question has gradually begun to shift away from whether or not to regulate, but how best to regulate.

CRYPTO REGULATION AROUND THE WORLD

Much of the regulatory framework is still being developed around the world. Whilst some countries are actively cultivating a regulatory environment to enable the crypto industry to grow, others are seen to be taking a reactive approach and some are taking strict restrictive measures. The opinions on the industry have been divided from the outset; most governments, financial institutions and even the media have swayed back and forth between dismissing crypto altogether, fearing its impact, to investigating the potential benefit of crypto. And now the different regulations being put in place reveal this stance. Countries are starting to specify rules and restrictions that will depend on a variety of factors including how crypto is used (ie. payments, investments, derivatives), how it is classed (ie. money, property, commodity) and taxation status. Many nations have started to find ways to tax on crypto gains and income.

According to the Library of Congress (LOC) November 2021 review, 103 countries are directing their financial regulatory agencies to develop regulations for banks and other financial institutions regarding crypto and their use in anti-money laundering and counter terrorism finance²². This includes the USA, UK, Canada, Australia and El Salvador; El Salvador is the only country in the world that has declared bitcoin to be legal tender.

There are 9 countries shown in **red** on the map that have absolute bans including China, Egypt, and Qatar. Russia also seems itching to join the list of countries with an absolute ban, but 2022 will see how that story unfolds. Forty-two countries including Bolivia and Turkey have implicit bans meaning that they cut off banking and financial system support for crypto such as the use of exchanges essential for trading.



²²Library of Congress, "Cryptocurrency around the world" (November 2021)

COUNTRIES WITH ABSOLUTE BANS ON CRYPTO

WHAT IS THE REGULATORY STANCE OF THE MAJOR ECONOMIES?



: CHINA (Population 1.4 billion)

China has a complete ban on crypto, which was implemented in different phases. China has been wary from the beginning and initially restricted banks from using Bitcoin as currency in 2013. Restriction became tighter with the banning of crypto exchanges and trading in 2019 although it remained possible for citizens to continue trading through international crypto exchanges. In 2021, China officially announced everything crypto-related was 'illegal financial activity'. This means citizens are banned from using any exchange services globally, cannot work for any crypto related companies and financial institutions are unable to provide any crypto-related services. It sent a clear message that even cryptocurrency transactions originating outside China will be treated as crimes. China is regulating internet content, access and advertising related to cryptocurrencies.

The 2021 crackdown on crypto-related business also include mining. With low electricity costs and the availability of cheap computer hardware, China had become a hub for Bitcoin

mining with 65-75% of the world's Bitcoin mining happening there. The mass exodus of miners from the country caused the value of Bitcoin to halve. It fell to below USD \$30,000 in June 2020 from its record high of USD \$64,000. However, Bitcoin had a surprisingly speedy recovery and bounce back, which demonstrated the resilience of the global bitcoin mining industry in particular, which was able to set up again quickly in places like Kazakhstan, Russia, and the USA.

Many factors likely led to China's final decision, including the volatile fluctuations of crypto being seen as a threat to the country's economic and financial stability as well as the use of electricity derived from coal for bitcoin mining, which threatened to undermine Beijing's commitment to reach carbon neutrality by 2060. Is this really the end for crypto in China' It is not clear whether this is a long-term strategy or a way of shifting the industry into a government-favored direction and clearing the path for the Bank of China issuing a digital Yuan.



Much like China, the USA is grappling with its own way of controlling the cryptoeurrency sector. Regulation of the crypto ecosystem in the US is complicated as there is no single federal authority that is responsible for it. Bitcoin is considered a commodity regulated by the Commodity Futures Trading Commission (CFTC), it is considered a property for tax-purposes by the IRS and Bitcoin futures exchange-traded funds (ETFs) come under the purview of the Securities and Exchange Commission (SEC).

These authorities have started laying out some regulatory frameworks, but there is a long way to go. Even though the actual buying and selling of cryptocurrency with blockchain technology are considered extremely secure, the SEC and CFTC have issued multiple warnings about cryptocurrency investments scams. They report that US consumers lost more than \$80 million dollars in such cryptocurrency-related investment scams in the 6 months between October 2020 and March 2021 which was over 10 times the amount lost during the same period a year previous. In 2018, the SEC launched a fake ICO website as a creative way to warn people of the dangers. The howeycoins.com site was complete with a whitepaper, celebrity endorsements and when users clicked to buy tokens, they were directed to a SEC information page revealing the scam as well as investor education. In December 2020, the SEC charged Ripple (XRP) for conducting an unregistered securities offering by raising \$1.3 billion through the sale of Ripple's XRP token; news sent the XRP token price down by half its value within a few days, though Ripple has more than recovered since then. Instead of settling the case, Ripple has decided to fight back. Ripple claim's that it deserves the same treatment that Ethereum received (a pass from the SEC), as Ripple's set-up is not materially different from Ethereum's. They also claim that while Ethereum launched based on an ICO, Ripple was actually backed by venture capital. All eyes are on this case as it will set precedence for crypto regulation in the US.

The SEC has also made claims that they are interested in the workings of Coinbase, one of the largest cryptocurrency exchanges, that achieved unicorn status in 2017, and went public in 2021. In June 2021, Coinbase announced plans for a product called Lend, which would allow cryptocurrency owners to loan out their coins and tokens for interest. In September, Coinbase announced that the SEC had threatened to sue the company over Lend, alleging that the offering involved a security. The SEC has not publicly commented on the matter, and Coinbase has suspended its Lend project, for the time being.





UNITED KINGDOM (Population 67 million)

The UK categorises crypto as 'property' but not as legal tender. The UK Financial Conduct Authority (FCA), HM Treasury, and the Bank of England make up the Taskforce initiated in 2018 to explore the impact of the crypto-asset market. Currently, crypto exchanges are required to register with the FCA and there is a ban on trading cryptocurrency derivatives to protect consumers from market volatility. The FCA have also created regulations around 'know your customer' (KYC), 'anti-money laundering' (AML) and 'counter-finance of terrorism' (CFT) tailored specifically for crypto-assets. In terms of taxation, investors pay capital gain tax on profits from crypto trading, and generally taxes are based on type of activity and transaction. The UK are in the process of gathering data and evidence from various stakeholders (including the views of industry, consumers, and regulators) on the use of digital assets which will then help make proposals for new laws taking into consideration the views of these stakeholders.

A QUICK LOOK AT THE MIDDLE EAST

Iraq and Qatar, along with much of North Africa have outright bans on crypto. Here is a non-exhaustive look at some of the regulatory stances taken by Middle Eastern countries so far.



Bahrain is looking to strengthen its crypto industry. The Central Bank of Bahrain (CBB) implemented a robust set of regulatory frameworks and supervisory measures to all crypto related activity in 2019. These cover rules for licensing, governance, minimum capital, control environment, consumer protection, risk management, anti-money laundering and counter-terrorism financing, standards of business conduct, avoidance of conflicts of interest, reporting, and cyber security for cryptoasset services. In January 2021, the sharia compliant CoinMENA exchange acquired the "Crypto Assets Services Company License" from the CBB allowing them to operate fully as a regulated crypto exchange and onshore platform in the country.





Though there is no formal regulatory framework for trading cryptocurrencies, Iran recognized cryptocurrency mining as a legal industry in 2018, regulating the mining farms in the country; this has led to a surge in crypto-mining farms in the country, and even more so - after China announced it would ban the activity in 2021. Some estimates put it at US\$660 million worth of crypto being mined in Iran each year, which is 4-6% of the world total. Despite legalizing crypto-mining, Iranian officials claim that the majority of crypto-miners are still operating illegally without proper licenses. In 2021, Iran was forced to shut-down and place temporary bans on the crypto-mining industry due to the country's electricity supply gaps causing blackouts across the country during high-surge times. Banks and money-changers in Iran are allowed to use cryptocurrencies minted by licensed miners to pay for imports, and trading or swapping cryptocurrencies is permitted. It has been reported that more than 11 million Iranians own and trade cryptocurrencies. More recently, in January 2022, Iran announced that its Central Bank and Ministry of Trade have agreed to start allowing merchants to use cryptocurrencies to settle international trade deals.





Israel legalized Bitcoin in 2017, and began building a regulatory framework around digital assets. The Israel Tax Authorities do not classify Bitcoin as a currency, but as a taxable asset. There is a 25% capital gains tax each time Bitcoin is sold, and Miners are treated as corporations and are liable for corporate income tax as well as the 17% VAT charge. In November 2021, there was an update to AML laws, requiring identification, reporting and registration of all cryptocurrency transactions.



The Jordanian government took a harsh stance on cryptocurrency, banning them outright initially. Today, the Central Bank of Jordan prohibits all banks, currency exchanges, financial service and payment service providers to facilitate cryptocurrency transactions. However, Jordan does not prohibit citizens from using international exchanges to buy and sell cryptocurrencies on their own.

(Population 4.3 million)



In Kuwait, financial institutions were banned from trading crypto in late 2017; however individual citizens can legally buy and sell crypto on supported exchanges. The Central Bank of Kuwait makes a point to caution against the use cryptocurrencies. They issued a public warning in May 2021 around the volatility of cryptos as well as to remind citizens that crypto is not considered as 'real currency'.





Crypto is legal but unregulated today in Oman. Citizens are warned of the risks involved and the lack of consumer protection. However, the Central Bank of Oman has launched a high-level task force set to study the impact, risks and potential economic advantages and disadvantages of crypto usage in the country. The output of which is likely to shape regulation going forward.

(Population 34.8 million)



Similar to Kuwait, financial institutions in the Kingdom of Saudi Arabia are not allowed to deal with cryptocurrency unless permitted by the Central Bank of Saudi (SAMA), and there currently is no crypto-related regulatory framework in place. That said, there are Crypto ATM's and citizens can trade cryptocurrencies legally in the Kingdom. SAMA has begun using blockchain technology in its activities in the banking sector and to keep pace with market trends. Project Aber was launched in collaboration by the Central Bank's of Saudi and the UAE, which is exploring the viability of a single dual-issued digital currency between the two economies to be used for domestic and cross-border payments between the two countries that operate on different currencies.





In September 2021, the UAE Securities and Commodities Authority signed an agreement with the Dubai World Trade Centre Authority (DWTCA) aimed at supporting the trading of crypto assets. The DWTC will essentially become a dedicated special crypto zone and regulator for cryptocurrencies, virtual assets, products, operators and exchanges. The DWTCA will be responsible for approving and licence financial activities relating to crypto assets; though the development of the associated regulations around investor protection, AML, compliance and crossborder transactions are still being developed. In October 2021, the Dubai Financial Services Authority (DFSA) released the first part of its regulatory framework for investing in digital tokens, as part of its' wider DFSA Digital Assets regime. In addition. As part of the UAE's new online security laws - which went into effect on January 2, 2022 – promoters of online cryptocurrency scams could face a possible five-year jail term and fines of over US\$270,000. In May 2021, the government released a statement to dissociate themselves from 'Dubai Coin' which was in fact an elaborate phishing website which was designed to steal and use personal information. UAE authorities have a growing interest in taking measures to protect the public from similar fake cryptocurrency schemes.



HOW TO MAKE REGULATION WORK AT THE GLOBAL LEVEL?

Crypto allows for both cross-border and cross-sector transactions which makes coordination particularly difficult given the various regulatory frameworks being set up in different countries. Many crypto exchanges also operate across borders and operate in offshore financial centres, which means that both supervision and enforcement is not only complicated, but nearly impossible without dedicated international collaboration. This makes regulation an evolving and global challenge that also needs to be addressed by international bodies as well as at a national level.

Some of the work in this area includes that of **The Financial** Action **Task Force (FATF)**, the inter-governmental body which sets international standards to prevent money laundering, terrorist financing and the financing of the proliferation of weapons of mass destruction. They have published specific guidance for virtual assets and virtual asset service providers (VASPS) as how to licence providers and carry out sufficient monitoring and supervision of activity.

In the EU, the **Markets in Crypto-Assets (MiCA)** proposal is part of the digital finance strategy which aims to create a single market for capital in Europe called the Capital Markets Union. MiCA will establish uniform rules for crypto assets for the block.

In addition, the International Monetary Fund have also released information on how global crypto regulation can be 'comprehensive, consistent and co-ordinated'.



CONCLUSION



Since its creation in 2008, Bitcoin has been no stranger to rising controversy in its impact and use cases. It has been called everything from the 'future of money' to 'a fraudulent pyramid scheme'. Even Governments and financial institutions have swayed back and forth between fearing its impact and dismissing crypto altogether, to investigating the potential benefits of crypto and its underlying blockchain technologies for its wide-reaching uses.

Of course, the ethos of blockchain-powered crypto has been to steer the power away from the central government and banks through new digital financial assets, and to make an open technology the driving force against the perceived control of these entities. The reality, at least today, is quite different from the initial vision. The Bitcoin whitepaper promised a 'peer to peer electronic cash system' however cryptocurrency today is mostly being used for speculation (investing), rather than spending. That said, it is still early days; Apple Pay's partnership with BitPay to allow for crypto payments will certainly help integrate the crypto and fiat currencies for daily real-world payments and applications. The development of the still immature but exciting DeFi market will surely spur even more value, moving towards the original peer-to-peer payments goal, and beyond.

Bitcoin and other cryptocurrencies have had fierce fluctuations in their value and have been shown to be extremely sensitivity to news headlines. Some say this is what happens when you remove market manipulation. Others say the crypto asset class is in its nascent "pricediscovery" stage, which tends to be an extremely volatile phase for any asset. For one thing, the influx of more institutional investors in the crypto-space has begun to add legitimacy to this asset-class, not least likely because the crypto market reached a market capitalization of over \$3 trillion at its 2021 peak. In 2021, JP Morgan launched a new debt instrument called the "Cryptocurrency Exposure Basket", tied to companies with crypto exposure, and Morgan Stanley announced that its wealth management clients would be given access to bitcoin funds. A survey of institutional investors found that 71% of Asian investors, 56% of European investors, and 33% of American investors currently invest in digital assets for their own or their clients' portfolios²³. The same study found more than 90% of all institutional investors surveyed were not only interested in digital assets, but expected to have allocations by 2026.

Many other institutional banks are also investing in later stage crypto-based businesses, adding confidence that crypto is no longer a fringe business; BNY Mellon participated in Fireblock's US\$133 million Series C, and has announced plans to partner with the start-up to become the custodian for digital assets on behalf of its institutional investors. Major corporations like Apple have begun to support cryptopayments, through the partnership between ApplePay and BitPay. And the further development and maturation of the DeFi world of decentralized applications using blockchain technologies will certainly add real value to the crypto ecosystem.

Though national regulations around crypto-related businesses seem to change regularly, and coordination at a global level has been extremely limited to date - there is movement; and it seems there are new crypto-players that not only expect, but want to support the development of regulations for the industry. What that regulation will look like, nobody seems to know - even the biggest marketmakers and crypto-enthusiasts seem to be ready to help. but no concrete frameworks are being distributed as yet. It's also understandable why the lack of clarity around how best to regulate these assets. As you now know, blockchain, cryptocurrencies, NFTs, and DeFi products and solutions these are all very different parts to the crypto-universe. Not only is the underlying blockchain technology something that requires a bit of research to understand, especially as there are not tens, but thousands of different blockchains active

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today. There are also over 10,000 different cryptocurrencies and tokens, some created seemingly just for trading purposes as they function today, and others that unlock gifts, products and services, or the ability to vote on how a DeFi platform gets developed. Add to that the energy demands of cryptomining (specifically for Proof-of-Work blockchains) that have real-world implications such as blackouts in country's where energy is limited, as well as on climate change - for those markets where the energy used is powered primarily by burning coal. It is estimated that the annual energy usage for the mining of Bitcoin alone, is the equivalent annual energy usage by the Netherlands or the United Arab Emirates. For those of you with a sustainability-oriented mindset, that would only like to invest in products and solutions that have a minimal negative environmental impact, perhaps focusing on blockchains and tokens that run on a Proof-of-Stake system would best suit.

As with any investment, and likely more-so because of crypto's nascency, participating in the crypto-universe will require research and due diligence on the part of individual investors and consumers – especially as there is limited regulation providing any consumer protections. That said, almost every industry on the planet went through an initial period of time without regulation; it is well known that regulation follows innovation, as you cannot regulate anything that does not exist. This is simply where this 13 year old industry sits today. We hope this report helped enlighten you with what's going on in the world of crypto today, and helps guide you in deciding what aspects of the crypto world you would like to research further on your own.

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A SPECIAL REPORT: AN INSIDE LOOK AT THE CRYPTO-UNIVERSE