

# COMING TOGETHER: FORGING COLLABORATIONS IN AN ERA OF PROFOUND CHANGE

GBBC 2021 Annual Report



**GBBC**  
Global Blockchain  
Business Council



**GLOBAL BLOCKCHAIN BUSINESS COUNCIL**

Geneva | Washington D.C. | New York | London

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# BOARD CHAIR UPDATE

**DAVID TREAT**  
GLOBAL BLOCKCHAIN & MULTIPARTY SYSTEMS LEAD  
**ACCENTURE**



My parents love to tell the story of carrying me up Mt. Madison in New Hampshire at the age of five months. Hiking trips were a staple of my childhood. Once my brother and I could carry our own packs, I remember my parents constantly reminding us how far we were from the peak, because we'd often fall for the "false" one that appears before it.

Another incredible year for the GBBC has revealed itself as one such peak on our journey to a blockchain- and digital-asset-enabled world that improves so much and inspires even more.

- **We convened 131 institutions to map out the blockchain and digital asset landscape**
- **We partnered with the Interwork Alliance on open standards, protocols and frameworks for globally scalable tokenized services**
- **We launched the nonprofit GBBC Giving with the Los Angeles Blockchain Lab and Center, empowering communities to close the digital divide**

Guided by our board and over 130 GBBC Ambassadors with expertise in the arts, sciences, education, healthcare and more across 68 jurisdictions, we debated the values underlying this wave of innovation and expanded our understanding of where we're headed.

This is simply the next visible frontier in our ascent to a digitally immersive world, where blockchain systems of record and digital assets merge with extended reality. This combination provides foundational capabilities for what's next—the "Internet of Places" or the metaverse—from digital identity to the ownership of unique digital objects. New digital markets, free from legacy infrastructure, will power a cascade of innovation and creativity as we rethink the future of work, collaboration, and commerce.

I'm fired up to move forcefully onto the higher ground that lies beyond. The power of what our technology wave triggers has only just started to reshape the world around us. We have every responsibility and opportunity to convene as an expert community and choose the most responsible, valuable, and inclusive paths forward.

Your partnership, engagement and caring are what makes this community great, and I'm proud to be of service with you all.



# CEO UPDATE

SANDRA RO

2021 was a pivotal year for the blockchain and digital assets ecosystem and for the GBBC. From skyrocketing interest in Non-Fungible Tokens (NFTs) to an explosion in cryptocurrency users, surpassing 200 million users, and growing conversations on tokenization, Web3, metaverse, green economy and the emergence of new digital micro-economies, the blockchain and digital assets industry has undoubtedly entered the mainstream conversation.

Understanding, however, may be another matter. Hype, noise, and some bad actors are contributing to general confusion, and in some cases negative reactions, to recent trends, particularly those related to NFTs and cryptoassets. At the GBBC, we have continued to: educate business leaders and government officials with facts, advocate the multi-faceted benefits of blockchain, and foment partnerships through convenings, which bring together diverse stakeholders to arrive at consensus and improved understanding. We see, and applaud, the great progress and close collaborations of our members and network, even in a year where we have remained physically distant from one another.

Over the past year, the GBBC not only experienced substantial growth but also expanded its horizons and reach with two major initiatives coming under the aegis of the GBBC:

1. LA Blockchain Lab and LA Blockchain Center became a GBBC initiative and were renamed GBBC Giving, a non-profit based in California, dedicated to galvanizing support amongst the blockchain and digital assets

community to empower underserved communities globally, mitigating the widening digital divide, and democratizing access to opportunity.

2. The InterWork Alliance (IWA) became an initiative of the GBBC. IWA is focused on empowering organizations to adopt and use token-powered services in their day-to-day operations through the development of standards and frameworks for blockchain-agnostic tokenization applications, including for voluntary carbon markets and debt issuance.

In 2021, we also introduced several new programs, including:

- Global Standards Mapping Initiative (GSMI) Fellows
  - An eight-month fellowship for exceptional students from partner institutions to contribute to GSMI.
- University Dialogues
  - Virtual programming designed to build bridges between students and innovative companies to foment blockchain understanding and skills at academic institutions.
- Investor Series
  - A forum for dialogue and knowledge exchange designed to educate the investment community on cryptocurrencies, digital assets, and blockchain technology.
- Executives in Residence
  - A group of leaders in their fields, many with extensive experience in financial services, who serve as trusted advisor to GBBC's executive team and Board of Directors.

Through our community of members, leaders, advisors, and ambassadors, GBBC remains committed to its vision of advancing adoption of digital assets and blockchain on a global scale. But if there's one thing we have learned from the collective challenges, failings, and wins of the past year, it is that no vision is complete without common values and a common mission.

As we begin a new chapter in 2022, we will not forget the WHY behind what we do - we grow the business of blockchain and digital assets industry to create more secure, equitable, and functional societies. As the largest global convening force for the blockchain and digital assets industry, we recognize the importance of our mission and

values in cultivating long-term growth and confidence in our industry and the innovative, paradigm-shifting applications and companies being built.

Thank you to our global community of more than 350 members and 180 ambassadors across 96 jurisdictions and disciplines, who stand behind our common mission and share our values to help our communities around the world.

As always, the GBBC Annual Report is a reflection of the incredible progress our industry and members have made towards building and deploying real-world applications with real-world impacts.

## GBBC'S BOARD OF DIRECTORS



**DAVID TREAT**  
GLOBAL BLOCKCHAIN &  
MULTIPARTY SYSTEMS LEAD  
ACCENTURE;  
GBBC BOARD CHAIR



**JOHN DEVADOSS**  
FOUNDER & PRESIDENT,  
NGD ENTERPRISE, INC



**DR. PETER T. GOLDR**  
CHIEF COMMERCIAL OFFICER,  
SIX DIGITAL EXCHANGE



**YUVAL ROOZ**  
CO-FOUNDER & CEO,  
DIGITAL ASSET



**STACI WARDEN**  
FMR. EXECUTIVE DIRECTOR,  
GLOBAL MARKET  
DEVELOPMENT PRACTICE,  
MILKEN INSTITUTE

**GBBC'S  
MEMBERS BY  
THE NUMBERS**

**360+**  
INSTUTIONAL MEMBERS

**55+**  
JURISDICTIONS



# GBBC'S THOUGHT LEADERSHIP

## REPORTS

GBBC published 9 open-access reports authored in partnership with GBBC members and partners as part of our ongoing "Open-Source Ideas" report series. Go to [gbbcouncil.org/initiatives/open-source-ideas-series/](https://gbbcouncil.org/initiatives/open-source-ideas-series/) to read these reports.

**PART I: BLOCKCHAIN TECHNOLOGY IN ENERGY MARKETS: SPOTLIGHT ON POWER LEDGER**

**PART I: DELIVERING 21ST CENTURY INFORMATION SECURITY**  
WITH BTP AND TAEKION

**PART I: DIGITAL ASSET LAWS IN SWITZERLAND**  
WITH MLL MEYERLUSTENBERGER LACHENAL FRORIEP

**PART II: IMPLICATIONS OF QUANTUM COMPUTING**  
WITH DRAGONCHAIN

**PART II: PROOF-OF-WORK MINING: SPOTLIGHT ON HUT 8 MINING**

**PART III: TRUST AND TRANSPARENCY IN THE U.S. 2020 ELECTION**

**GBBC OVERVIEW OF NON-FUNGIBLE TOKENS (NFTS)**

**GBBC OVERVIEW OF U.S. FINANCIAL SERVICES: ANNOUNCEMENTS ON BLOCKCHAIN TECHNOLOGY, CRYPTOCURRENCIES, AND DIGITAL ASSETS**

**GBBC TOP TEN: DIGITAL ASSET AND CRYPTOCURRENCY HIGHLIGHTS**

## A FEW OF OUR OPINIONS AND THOUGHTS IN 2021

**"DEAR CRYPTO DERIVATIVES INDUSTRY, LET'S NOT REPEAT 2008"**  
GBBC CEO SANDRA RO WRITES IN COINDESK

**"WE DON'T NEED A NEW REGULATOR TO HAVE BETTER CRYPTO REGULATION"**

GBBC CEO SANDRA RO WRITES WITH DONNA PARISI OF SHEARMAN & STERLING LLP IN COINDESK

**"WHAT THE COVID-19 PANDEMIC HAS TAUGHT CRYPTO COMMUNITY ABOUT CURBING OUR EMISSIONS"**

GBBC DIRECTOR OF COMMUNICATIONS SOFIA AREND WRITES WITH SENSORIUM IN COINTELEGRAPH

# GLOBAL STANDARDS MAPPING INITIATIVE 2.0

The most comprehensive effort to map and analyze the blockchain and digital assets landscape across five key areas:

1. Legislation and regulatory guidance
2. Technical standards
3. Industry standards and recommendations
4. University courses and degree programs
5. Industry consortia

IN TOTAL, GSMI 2.0 CATALOGUED OUTPUTS FROM:

**187**

JURISDICTIONS

**479**

INDUSTRY GROUPS

**38**

TECHNICAL STANDARDS  
SETTING ENTITIES

GO TO [GBBCOUNCIL.ORG/GSMI](https://gbbcouncil.org/gsmi) TO CHECK OUT THE FULL RESULTS FROM GSMI 2.0, INCLUDING THE REPORT, AN INTERACTIVE MAP, AND MORE



# INTERNATIONAL JOURNAL OF BLOCKCHAIN LAW

GBBC's Legal & Regulatory Group (LRG), made up of leading global law firms, studies and anticipates regulatory challenges and changes facing the ecosystem.

In 2021, GBBC's LRG released the inaugural volume of the International Journal of Blockchain Law (IJBL), an open access online journal of blockchain law, written and edited by lawyers, and designed to help interested business and non-legal communities better understand the world of blockchain and digital assets.



## FEATURED AUTHORS:

- Commissioner Caroline Crenshaw, U.S. Securities and Exchange Commission (SEC)
- Ciarán McGonagle, International Swaps and Derivatives Association (ISDA)
- Alexander Lipton, SILA
- Lewis Cohen, DLX Law
- Eric W. Hess, Hess Legal Counsel
- Christopher D. Clack, Professor, University College of London (UCL)
- Andrew Hinkes, K&L Gates
- Ciara Cullen, RPC
- Alessandro Cerri, RPC
- Sophie Parkinson, RPC

## IJBL EDITORS



**EDITOR-IN-CHIEF**  
**DR. MATTHIAS ARTZT**  
SENIOR LEGAL COUNSEL  
DEUTSCHE BANK



**LOCKNIE HSU**  
PROFESSOR  
SINGAPORE MANAGEMENT  
UNIVERSITY



**STEPHEN D. PALLEY**  
PARTNER  
ANDERSON KILL



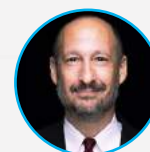
**THIAGO LUÍS SOMBRA**  
PARTNER  
MATTOS FILHO



**ANDREA TINIANOW**  
CHIEF LEGAL OFFICER  
IOV LABS



**JAKE VAN DER LAAN**  
CHIEF INFORMATION OFFICER &  
DIRECTOR  
FINANCIAL AND CONSUMER SERVICES  
COMMISSION, NEW BRUNSWICK,  
CANADA (FCNB)



**GARY D. WEINGARTEN**  
ASSISTANT VICE PRESIDENT,  
DATA PROTECTION OFFICER  
NOTARIZE, INC

# INTERWORK ALLIANCE

Incubated with the Enterprise Ethereum Alliance, the InterWork Alliance (IWA) ([interwork.org](https://interwork.org)) became a GBBC initiative in 2021. The InterWork Alliance (IWA) is a member-led initiative focusing on creating open-source, platform neutral tokenization standards to promote interoperability and enable organizations to adopt token-powered services.

Following the merger with GBBC, the IWA Board of Directors transitioned into the IWA Leadership Council. Together, with GBBC's leadership, the IWA Leadership Council drives the vision and work of IWA.

## IWA LEADERSHIP COUNCIL



**MARLEY GRAY**  
MICROSOFT;  
IWA LEADERSHIP  
COUNCIL CHAIR



**JOHN DEVADOSS**  
NGD ENTERPRISE, INC.



**MICHAEL KLEIN**  
ACCENTURE BLOCKCHAIN  
TECHNOLOGY



**DR. PETER GOLDER**  
SIX DIGITAL  
EXCHANGE



**SANDRA RO**  
GBBC



**ERIC SARANIECKI**  
DIGITAL ASSET

## 2021 IWA MILESTONES AND HIGHLIGHTS

- IWA merges with GBBC and becomes an initiative of GBBC
- IWA's Voluntary Carbon Markets (VCM) Taskforce releases two seminal white papers defining the architecture and standards for tokenization of key elements for carbon credits



### VOLUNTARY ECOLOGICAL MARKETS OVERVIEW

The standards and architecture developed by the VEM Taskforce are adopted by Hedera, Microsoft, Xange, and others

### DIGITAL MEASUREMENT, REPORTING & VERIFICATION FRAMEWORK

Released in partnership with Microsoft



## LOOKING AHEAD TO 2022, IWA WILL FOCUS ON:

- Driving tokenization standards for member-led use cases focused on sustainability and debt issuance
- Building the next version of our open-source Token Taxonomy Framework (TTF) to enable broader implementation of IWA standards and frameworks. Access IWA's GitHub to learn more.

# POST TRADE DISTRIBUTED LEDGER GROUP

GBBC's Post Trade Distributed Ledger (PTDL) Group is composed of more than 80 financial, legal, and academic firms in GBBC's membership. PTDL has served as a rallying point for prominent financial institutions since 2015 and became a GBBC initiative in 2018.

## PTDL LEADERSHIP COMMITTEE



**ANDRE PORTILHO**  
BTG PACTUAL



**KERRY DENERSTEIN**  
CLS GROUP



**DOTUN ROMINIYI**  
LONDON STOCK  
EXCHANGE GROUP



**HANNAH MEAKIN**  
NORTON ROSE  
FULBRIGHT



**MICHELE CURTONI**  
SIX DIGITAL  
EXCHANGE (SDX)



**MATTHEW SHEPHERD**  
WELLS FARGO

## PTDL 2021 SPEAKERS

AAVE	International Securities Services Association (ISSA)
Archon Advisors	J.P. Morgan
BNY Mellon	LiquidX
Borsa Italiana	Microsoft
BTG Pactual	Norton Rose Fulbright
Consensys	QR Capital
CoolBitX	Red Date Technology
Digital Asset (DA)	Rise Financial
Diversi.fi	Securrency
Deutsche Bank	SIX Digital Exchange / SIX Group
Dragonchain	Stellar Development Foundation
Fudan University Fintech Center	U.S. Congressman Tom Emmer (MN-06)
The Global Standards Mapping Initiative (GSMI) 2.0	U.S. Department of Commerce
The International Journal of Blockchain Law (IJBL)	U.S. Senate Committee on Banking, Housing and Urban Affairs
Global Digital Finance (GDF)	VMware
InterWork Alliance (IWA)	



# GBBC'S 2021 EVENTS

Despite the challenges of the pandemic, the GBBC focused on convening community and fomenting dialogue. In 2021, GBBC produced and co-produced:

**112**

PANELS AND SESSIONS

WITH SPEAKERS FROM

**30+**

JURISDICTIONS

## BLOCKCHAIN CENTRAL UNGA

GBBC's yearly flagship event, Blockchain Central UNGA, returned for a mix of virtual and in-person programming. Thanks to the generous support of Shearman & Sterling, more than 100 attendees safely gathered at Shearman & Sterling's New York City conference center for 14 panels and sessions focused on the role of community and technology in accelerating progress towards the United Nations Sustainable Development Goals.

The event also included virtual programming and all sessions were livestreamed, attracting ~1400 unique online viewers.



## BLOCKCHAIN CENTRAL INDIA



GBBC had the privilege of partnering with the Government of Telangana to host our first-ever Blockchain Central India, convening leaders from government and industry to discuss India's blockchain landscape and the future of money.



Special thank you to Shri Jayesh Ranjan and Smt. Rama Devi Lanka from the Government of Telangana for their support.

Thank you also to our honored guest Dr. Rajendra Kumar, Additional Secretary, Ministry of Electronic and IT (MeitY), Government of India.



## GBBC VIRTUAL MEMBERS' SUMMITS

Each year, the GBBC community gathers in Davos, Switzerland for “Blockchain Central Davos,” our annual week-long event to set the agenda and priorities for the year ahead.

Given the ongoing COVID-19 pandemic, we hosted three members-only virtual summits across EMEA, APAC, and the Americas with government officials, regulators, and industry leaders focused on our priorities for 2021:

- Digital Infrastructure and the Digital Economy
- Global Standards and Regulation
- Sustainable and Resilient Systems

3

GLOBAL SUMMITS

34

DISTINGUISHED  
SPEAKERS

250+

GBBC COMMUNITY  
PARTICIPANTS

9.5

HOURS OF DISCUSSION  
AND DISCOURSE

## A FEW PLACES YOU MAY HAVE SEEN US

Over the course of 2021, GBBC’s executive leadership participated in more than 50 events and media appearances. Here are a few of the places where you might have seen us:



## SINGAPORE FINTECH FESTIVAL

GBBC curated a panel discussion on “Blockchain Adoption in Financial Services” at the Singapore Fintech Festival in November of 2021

## BSN GLOBAL PARTNERSHIP CONFERENCE

GBBC partnered with the Blockchain-based Service Network (BSN) to produce the international day of their 2nd annual “BSN Global Partnership Conference.”





# GBBC'S AMBASSADORS

**THE GBBC'S BIGGEST STRENGTH IS OUR PEOPLE. WE THRIVE ON BRINGING PEOPLE TOGETHER TO EXPAND OUR GLOBAL COMMUNITY, PRESENCE, AND IMPACT.**

## GBBC AMBASSADORS

GBBC Ambassadors act as trusted advisors to the GBBC's leadership and members, providing invaluable guidance and assistance on how to engage with diverse global communities to carry out the GBBC's mission to the highest of standards.

GBBC's 2022 Ambassadors represent an exceptional group of innovators and changemakers with an emphasis on technology, governance, law, finance, civil society, and academia

You can read the full list of ambassadors at [gbbcouncil.org/about](https://gbbcouncil.org/about)

**180**  
AMBASSADORS

**96**  
JURISDICTIONS  
AND DISCIPLINES



# **OUR MEMBERS' WORK**



# THE FUTURE OF FINTECH

## CRYPTOCURRENCIES CONSIDERATIONS FOR INSTITUTIONAL ADOPTION



In the world of blockchain, 2021 will most likely be remembered for the broader adoption of cryptocurrencies, which continues to gain pace, and the emergence of novel business models – prominently displayed through the rapid adoption of NFTs and DeFi. The relentless pace of change that the world of digital assets has experienced over the last few years is unlikely to abate and prompts questions about how institutional investors should prepare for the future. As a shaper rather than a predictor of the future, the following three considerations seem sensible at the time of writing:

**REGULATION:** crypto and DeFi have gotten too big to be ignored; yet, across the globe, they have been regulated differently. We see two activities unfolding: increased regulation and thus definitional clarity about the treatment of crypto and DeFi at national level, and increased alignment at the supranational level to avoid regulatory arbitrage between different jurisdictions.

**MONEY IS MERCENARY:** with current interest rates at a long-time low, investors are seeking riskier opportunities. In the realm of crypto

there is plenty of choice, which in turn will further increase demand for crypto-based propositions or novel business models that provide ample opportunity for alpha generation.

**FROM A to B – ‘BRIDGES TO THE FUTURE’:** direction of travel is helpful but not sufficient or prescriptive enough to define actionable steps towards the future. How do we get from Grand Ambition/Big Impact to Small Steps and the execution of ideas? The notion of ‘Bridges to the Future’ provides a focus on building our future through a portfolio of diversified real options that allow us to traverse multiple bridges to get to the future whilst avoiding a single point of failure, as well as the opportunity to make use of multiple bridges to increase our probability of success (i.e., to ensure corporate relevance as we migrate to the future).

We surmise that the above considerations can provide guidance and act as a set of landmarks on a map that looks at the development of opportunities across crypto, DeFi, and the Metaverse in an efficient manner to future-proof our digital explorations.



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## A WISH FOR THE FUTURE OF OPEN BUSINESS

2021 was a banner year for digital assets, blockchain, and distributed ledger technology (DLT). Market caps of some cryptocurrencies eclipsed those of Fortune 500 companies. Non-fungible tokens (NFTs) dominated the collective consciousness. Nations banned crypto for the tenth year in a row. Markets reinvented shorting derivatives, and incumbents got kind of, sort of serious about participating.

The chasm between the challengers and the incumbents is widening, with the former sprinting toward occasionally overzealous innovation, and the latter often stuck in cycles of lift-and-shift with legacy technologies and methodologies. The innovators are winning because they are embracing the strategy of Open Business — a shift in mindset and architecture that enables a truly interconnected global economy.

### The Opportunity for TradFi

Our capital markets infrastructure is built on the concept of cascading liabilities and consolidated, centralized ownership — all in the name of efficiency. That represents tremendous risk to all investors, both big and small. It also means people don't own anything directly. Not the stocks in their portfolio, the cash in their checking, or the Bitcoin in their Coinbase account. What people hold is a promise backed by the

## Digital Asset

depository institution — the equivalent of a credit default swap without the yield.

We hope regulators will catalyze a wave of innovation by pushing for, and supporting, direct asset ownership. This would drive firms to offer a wider range of personalized services to anyone who can share, direct, and manage their own assets — crypto and otherwise — via DLT platforms or digital wallets. Firms would have to compete on services, experiences, and value-creation for customers, as they should.

Central banks have a once-in-a-generation opportunity to lead this revolution by expanding their ledgers and granting name-on-register access to all customers. Such a central bank digital currency (CBDC) system would propel us into a world where traditional institutions would no longer be depositories, but true providers of financial services.

We have reason to be optimistic. The technology is ready for the Open Business revolution. We have many of the raw materials and ingredients we need for a smarter, safer, more client-centric financial system. New platforms, new business models, and new ways of thinking about the potential of those technologies are making this revolution tangible. Our hope for 2022 is that we get closer to seeing it become a reality.

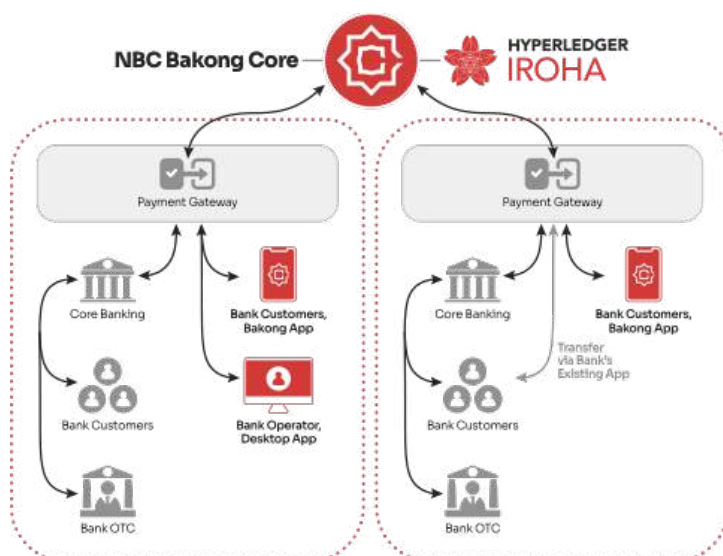
## SORAMITSU UPDATE



SORAMITSU ([www.soramitsu.co.jp](http://www.soramitsu.co.jp)) is a boutique fintech company with a diverse and highly skilled international team of over 120 employees. We build innovative payment and asset management systems, focusing exclusively on blockchain technology. While we work with several blockchains, our platform of choice is Hyperledger Iroha, an open-source blockchain that we designed for the Linux Foundation.

Bakong is the first blockchain-based retail payment system to be launched by a central bank; it has processed tens of millions of dollars of transactions by hundreds of thousands of users across 29 financial institutions and its user base is growing daily.

Using Bakong, anyone with a Cambodian phone number and smartphone can send and receive instant digital payments in Khmer Riel or USD. Bakong marks a new stage in the modernization of the Cambodian financial system and is creating new opportunities for citizens -- especially those who are currently unbanked or underbanked. For SORAMITSU, Bakong is an important milestone on the path toward our end goal of improving the efficiency, security, and accessibility of financial systems worldwide. Our work on Bakong was recognized by the *Central Banking Journal* with its inaugural award for Central Bank Digital Currency Partner in 2020, as well as the Japan Financial Innovation Award in 2021.



Hyperledger Iroha's security and scalability lend it to use in systemically important payment systems such as Project Bakong, an integrated payment system built by Soramitsu in cooperation with the National Bank of Cambodia.

Our work on Bakong is also being applied to other countries. We were awarded a grant from the Japanese government to work with the Central Bank of the Lao PDR to study the applicability of a CBDC to their country. We are also collaborating with NTT Data Institute of Management Consulting on a Japanese government-sponsored study of the applicability of digital currencies to Fiji, the Solomon Islands, Tonga, and Vanuatu. The experience we gained from Bakong is directly applicable to the research being conducted in these countries.



SORAMITSU is also uniquely experienced in decentralized finance, or DeFi. We were awarded a Web3 Foundation grant to build Polkaswap, a decentralized exchange for the Polkadot ecosystem. We are also the Web3 Foundation subcontractor for the C++ implementation of Polkadot Host and the Filecoin Foundation subcontractor

for the C++ implementation of Filecoin. While DeFi has a reputation for complexity, we believe that access to democratized liquidity can benefit a broad audience: this belief drives another innovation, Fearless Wallet, a cryptocurrency mobile app tailor-made for the Kusama and Polkadot ecosystems.

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## U.S. AUTHORITIES SIGNAL THEY ARE READY TO TAKE ON STABLECOINS

LATHAM & WATKINS LLP

Regulators worldwide have become acutely aware of how stablecoins function as a bridge between traditional financial markets and digital asset markets. As a result, regulators are seeking to address the risks, opportunities, and regulatory gaps presented by this burgeoning asset class.

The United States is now at an inflection point for stablecoin regulation. On November 1, 2021, the President's Working Group on Financial Markets in conjunction with the Federal Deposit Insurance Corporation and the Office of the Comptroller of the Currency published its long-anticipated "Report on Stablecoins."

The opportunities of a well-designed stablecoin arrangement were mentioned at the outset, including the potential to support faster, more efficient, and more inclusive payments options. However, the Report does raise and consider numerous risks posed by stablecoins to better ascertain where agencies such as the Securities and Exchange Commission, the Commodity Futures Trading Commission, and the Financial Action Task Force have a handle on those risks, and where further action is needed by legislative or regulatory authorities. Some of the critical risks highlighted include failure of stablecoins to maintain a stable value relative to a reference asset; potential for runs on the market

due to loss of confidence and mass redemptions; potential for contagion in the digital asset markets or even the wider financial system due to stablecoin runs.

The Report states that its recommendations build on the work of international forums, such as the Financial Stability Board (FSB)'s high-level recommendations for supervising global stablecoins published in October 2020. The FSB recommendations included increased regulator coordination and oversight of stablecoin arrangements to ensure that governance and risk management frameworks are in place to minimize systemic risks. A recent joint consultation by the Committee on Payments and Market Infrastructures and the International Organization of Securities Commissions on the regulation of stablecoin arrangements is also acknowledged.

At the top of the Report's recommendation list is the need for Congress to "act promptly to enact legislation to ensure that payment stablecoins and payment stablecoin arrangements are subject to a federal framework on a consistent and comprehensive basis."

Although the Report concludes that legislation is urgently needed to address the many risks outlined, it is also clear

that to the extent stablecoin activity falls under the jurisdiction of the SEC or the CFTC, these agencies have broad enforcement, rulemaking, and oversight authorities that may apply depending on the facts and circumstances. However, the disparate patchwork of regulatory oversight in the U.S. that is currently in place leaves markets vulnerable to the numerous risks and regulatory gaps delineated in the Report. This is

especially true where existing legal obligations are limited, ambiguous, or nonexistent.

Until legislation is enacted, regulatory fragmentation (and agency competition to fill the gaps) may continue to cast a shadow over stablecoin arrangements as well as the entire digital asset market. Learn more at <https://www.fintechandpayments.com>

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## **BLOCKCHAIN AND SMART CONTRACTS COMBINE TO IMPROVE POST-TRADE**



In the Time for trust: The trillion-dollar reasons to rethink blockchain report, payments and financial instruments were identified as one of the top five uses of blockchain that have the potential to yield the most economic value. Reportedly, by 2030, its potential boost to global GDP will be about \$433 billion USD. One area where blockchain and related technologies can be combined to improve efficiency and trust is post-trading of securities.

In post-trade — which involves multiple activities, functions, and participants — trust and efficiency are often brought into question. With the coexistence of traditional and digital assets, the ever-growing demand for cross-border investments, and remote access to trade being increasingly common, the efficiency and transparency of operations have come under further scrutiny.

LiquidShare, a fintech startup founded in 2017 by eight major European financial institutions, has addressed post-trade related frictions by building a platform that streamlines back-office operations and enhances the transparency and trustworthiness of processes.

Launched in 2021, LiquidShare's post-trade offering is underpinned by BTP's Sextant, a solution that delivers enterprise-class distributed ledger and smart contract infrastructure. By simplifying the deployment and management of the Daml runtime environment and the underlying distributed ledger — the open-source Hyperledger Besu — Sextant allowed LiquidShare to focus on the business logic rather than the underlying technology infrastructure. The Hyperledger Besu-based implementation enables post-trading participants to share information and collaborate in a decentralized and trustworthy manner, with none of the individual parties having the ability to one-sidedly enforce decisions, either accidentally or in bad faith, as each participant has an immutable, golden copy of the truth. The smart-contract programming language, Daml, enabled LiquidShare to embed rules and business logic easily and rapidly.

LiquidShare is looking to arm the post-trade ecosystem participants with tools — leveraging distributed ledgers and smart contracts — to make transactions more efficient and trustworthy.



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## BRIDGING CBDC WITH EXISTING PAYMENT RAILS



As central banks around the world dig deeper into Central Bank Digital Currency (CBDC), questions on adoption and usability are top of mind. Once you've built the technology to power CBDC, how do you help make sure people can manage and spend their funds through a familiar, trusted, and seamless experience, on day one?

ConsenSys and Visa partnered to develop new infrastructure that can help central banks and traditional financial institutions come together and build simple, user-friendly services on top of CBDC networks.

Visa's CBDC Payments Module is designed to provide an on-ramp for CBDC to existing payment networks so that CBDC networks can easily connect to traditional financial service providers. For banks and issuers processors, they'll be able to plug into the module, integrate their existing infrastructure, and be enabled to do things like issue CBDC-linked payment cards or wallet credentials for consumers to use.

This will be integrated with the ConsenSys Codefi CBDC sandbox powered by ConsenSys Quorum, so that Visa platform can be ready to tap into enterprise blockchain technology.

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## ONYX BY J.P. MORGAN



Formed in 2020, Onyx by J.P. Morgan ("Onyx") has pioneered blockchain-based platforms for the exchange of value,

information, and assets. Our mission is to help banks, large multinational corporations, and fintechs adopt a financial infrastructure that is fast and transparent to all participants.

Onyx is composed of four key product segments:

- **Liink by J.P. Morgan<sup>SM</sup>** – A peer-to-peer blockchain network that supports faster transactions by enabling the seamless exchange of payment-related information between institutions.
- **Coin Systems** – Powering 24/7, real-time value transfer, through next-generation payment rails.

- **Blockchain Launch** – A center of excellence and a leader in developing and launching new applications, networks, and shared-platform technology.
- **Onyx Digital Assets** – A blockchain network that enables the exchange of value for a broad range of digital assets.

To learn more visit: <https://www.jpmorgan.com/onyx/index>

### **Liink by J.P. Morgan<sup>SM</sup>**

Liink by J.P. Morgan is the first bank-led, production grade, scalable and peer-to-peer blockchain-based network. It serves to address the longstanding challenges of sharing payments-related information across institutions. More than half of the world's largest banks have signed

up to join Liink, using shared ledgers to simplify information exchange.

Initial and planned applications\* for Liink include:

- **Confirm** is a global and payment agnostic peer-to-peer account validation solution that connects participants to inquire and respond on account information prior to payment initiation across a wide range of geographies and payment types. Responders are able to monetize their existing data sets by providing their information on the network, and inquirers are able to make more intelligent payment decisions by pre-validating account information with the intent of reducing payment fraud and related exceptions.
- **Resolve** allows participants to streamline payment-related compliance inquiries by exchanging verification information through Liink. Institutions can send requests to other participants on the network to obtain select verification data elements. As a result, institutions can reduce the burden of compliance processes and speed up transaction processing.
- **Route Logic** is an application that can be used to validate whether a cross-border payment is convertible

into the local currency in near real time. Participants benefit from having an additional screening resource for eligible payments, which can lead to improved settlement times and FX cost savings for their remitter and beneficiary clients.

- **CheckMatch\*** is an application in development that helps streamline the processing of checks, enabling check originators to electronically transmit critical information to lockbox providers, enabling check payment processing without the need to mail and process physical items.

## ONYX DIGITAL ASSETS

At the end of 2020, J.P. Morgan launched Onyx Digital Assets, a blockchain-based network that enables the processing, recording and Delivery-vs-Payment (DVP) exchange of digital assets across asset classes. The network provides access to JPM Coin which is leveraged to support the payment leg of Onyx Digital Assets transactions. Its first live application was for the execution of intraday repurchase transactions or 'repos'. This allowed for the simultaneous exchange of cash for securities on a blockchain without physical movement of securities. By more efficiently securing a portion of liquidity provision to J.P. Morgan clients with intraday collateral, J.P. Morgan aims to reduce exposure to counterparty

*\* Currently in development. Not offered as a live product. Offering as a live product is subject to completion of development and internal review, as well as obtaining any regulatory approval which may be required.*

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credit risk. J.P. Morgan's solution was to create a scalable intraday repo product that materially alleviates the challenges and costs currently associated with managing intraday liquidity for clients.

### **Blockchain Launch**

Onyx has developed an innovation center that focuses on creating blockchain-based solutions, networks, and platforms with real-world applications. This saves our clients time, resources, and costs so they can get their ideas to market faster. Our approach allows clients to:

- Bring digital use cases to life with rapid prototype and development models\*
- Tap into an established, vetted network for multi-asset, on-chain cash transactions

### **Coin Systems**

In 2019, J.P. Morgan became the first global bank to design a blockchain-based platform to facilitate 24/7, business-to-business money movement.

The JPM Coin System is a permissioned system that serves as a payment rail and deposit account ledger and allows participating J.P. Morgan clients to transfer U.S. dollars held on deposit with J.P. Morgan to each other, facilitating movement of these payments in real time and solving common hurdles of traditional cross-border payments, such as delays caused by region-specific holidays or local bank branch cut-off hours that differ between the locations of payment parties.

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## **BLOCKCHAIN AND SMART CONTRACTS COMBINE TO IMPROVE POST-TRADE**



State Street, Vanguard, and Symbiont collaborated to complete the first successful live trade of a foreign exchange forward contract on October 27, 2021, a major step towards automating the largely manual Foreign Exchange (FX) forwards market. Using Assembly, Symbiont's distributed ledger technology, State Street and Vanguard initiated the Fusion Live Pilot, which consisted of two offsetting 30-day FX forward contracts. The blockchain technology brought post-trade workflow automation and efficiencies to the collateralization process. Assembly fully automates the daily mark-to-market valuations, and the corresponding variation margin, and initiates the instructions for the margin call and collateral movements.

Harnessing the benefits of blockchain

technology within the largely manual currency forwards market will eventually enable the underlying contracts to be instantiated, signed, executed, and documented on a single unalterable record, digitally securing the trades and allowing for automation over their duration. Deploying these contracts on DLT facilitates frequent and automated valuations, enabling parties in the network to move and settle collateral instantaneously — significantly reducing counterparty risk and streamlining processes for forwards that are non-cleared and subject to margining.

Since the 2008 financial crisis, the Basel Committee and the Federal Reserve adopted multiple regulations that establish minimum regulatory capital requirements for financial institutions. These requirements are calculated

using the risk-adjusted capital ratio (total adjusted capital/risk-weighted assets), which indicates a financial institution's ability to sustain a severe economic downturn. The resulting higher capital requirements give financial institutions a strong incentive to reduce their risk-weighted assets (RWA).

FX forwards utilize a large share of RWA because they are over-the-counter derivatives. These transactions are dealt directly with counterparties, which significantly increases risk when uncollateralized. In the current state, the collateralization process is tedious and manual, requiring multiple actions and agreement from each party involved. Assembly's DLT-enabled platform addresses these problems through automation, reducing counterparty risk and freeing up RWA.

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## **MONEYGRAM INTERNATIONAL AND STELLAR: BRIDGING DIGITAL ASSETS AND LOCAL CURRENCIES**

**Stellar  
Development  
Foundation**

MoneyGram International is a leader in the evolution of digital P2P payments, serving nearly 150 million people around the world. Stellar is a decentralized network for financial products and services, designed to connect the world's financial infrastructure.

### **The Challenge**

There is tremendous friction in the traditional financial system. Consumers face obstacles related to speed, efficiency, and affordability whether they're sending money across borders, exchanging local currency, or moving between cash and digital currencies.

Although utility and adoption of digital assets is growing, cash isn't going anywhere. Many markets still run on cash, often serving large un- and under-banked populations. Stablecoins are changing the future of digital currency, but even so, only a few stablecoins are multi-chain compatible and have "cash-out" functionality.

### **The Solution**

To help alleviate existing frictions, MoneyGram International and the Stellar Development Foundation are teaming up to bridge digital and fiat currencies. The collaboration will enable cash-in and cash-out in local currency for consumers at participating MoneyGram locations, using USDC for near-instant settlement. Users will be able to move seamlessly from one cash currency to another powered by the Stellar blockchain and MoneyGram's international retail platform. This will also introduce a new segment of cash users to the ability to convert their cash into and out of USDC, giving them access to fast and affordable digital asset services that they may not have considered before.

This work will help improve the utility and liquidity of digital assets while allowing more consumers to participate in the digital economy, providing greater access and inclusion to the global financial system.

The pilot was launched at the end of 2021. Eleven markets (Argentina, Canada, Colombia, Egypt, Guatemala, Kenya, Philippines, Poland, Turkey, Ukraine, and the U.S.) will have cash-in capability upon the service's full launch in 2022.

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## **BRIDGING CBDC WITH EXISTING PAYMENT RAILS**

**bitt**

Bitt's modular Digital Currency Management System (DCMS) offers the world's most comprehensive, and widely used, fintech solutions for central banks/monetary authorities, financial institutions, and governments. These solutions allow them to integrate their existing core banking and back-office software, accounting systems, other

payments applications, and wallets with digital monetary instruments, namely stablecoins and CBDCs.

Bitt's digital currency and stablecoin solutions are designed to be blockchain agnostic. We work with our clients to determine the best blockchain network for their use-cases. So far,

our technology is interoperable with institutional-grade blockchain networks such as Hyperledger and Stellar. We are actively working on incorporating other networks like Corda and Quorum. Every component of Bitt's production-ready suite of products can be tailored to the unique needs of a country's economy to effectively integrate into the country's existing financial system.

Bitt's Monetary Authority Suite enables central banks to mint and pilot, or issue, their own digital currency. This suite has been used to create the world's first CBDC pilot in a currency union and the world's largest CBDC issuance.

Increased regional trade, more efficient cross-border payments, and financial inclusion are driving forces for these pioneering CBDC initiatives:

- DCash for Eastern Caribbean Central
- Bank eNaira for Central Bank of Nigeria

The Financial Institution Suite enables financial institutions to pilot or issue their own digital currency and integrate with existing digital currency systems, including CBDCs and stablecoins:

- NBB Pay for National Bank of Belize
- e-Hryvnia for TAScombank JSC

The Digital Currency E-Government Suite has extensive stock features that are applicable to governments seeking to manage and transact in digital currencies.

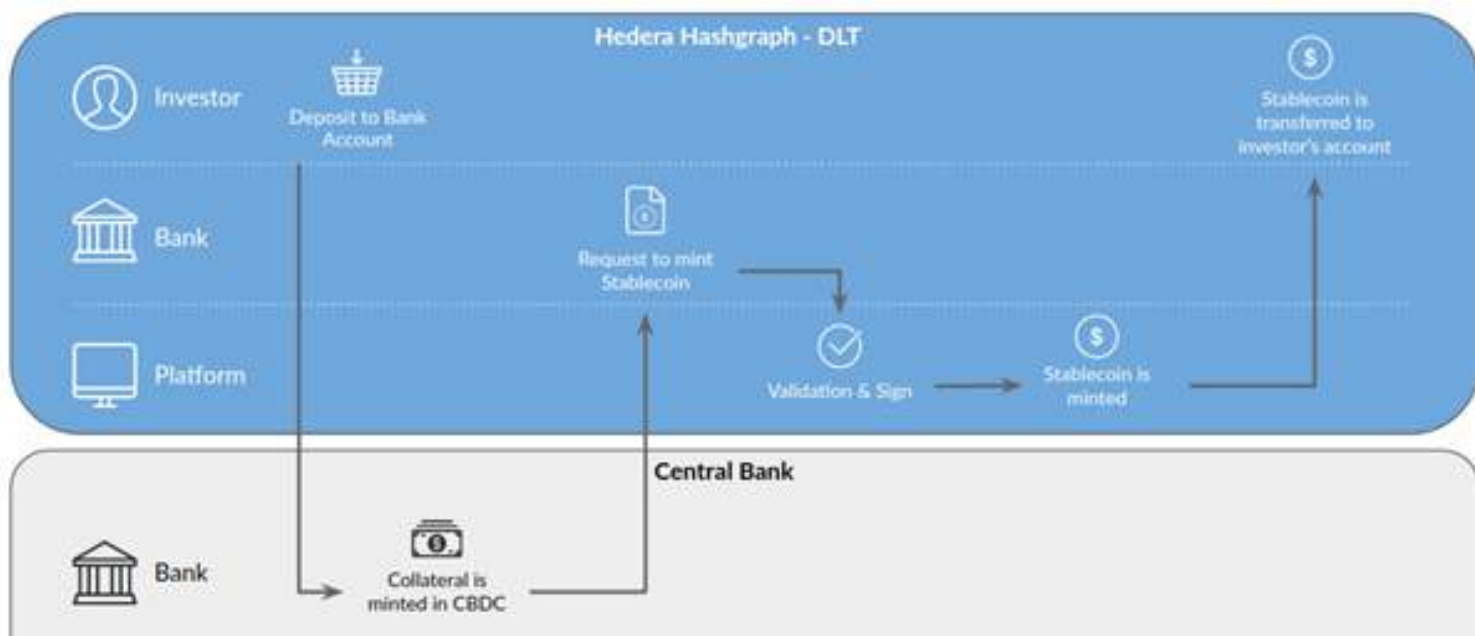
## DEBENTURES PLATFORM: CBDC AS COLLATERAL AND STABLECOIN USAGE



ioBuilders is collaborating on a project to explore the policy and regulatory implications of innovation in financial markets driven by distributed ledger technology (DLT).

In particular, this project aims to create a minimum viable product (MVP)

marketplace to trade bonds on DLT using tokenized money. All industry participants will be able to trade these bonds using the platform stablecoin and managing the collateral with a wholesale central bank-issued digital currency (CBDC), all of it powered by Hedera Hashgraph DLT technology.



The solution is currently focused on the following objectives:

1. Definition of the functional requirements of a Commercial to Central Bank tokenization process to enable retail/wholesale debenture investments to be implemented cross-chain and CDBC-based.
2. Definition and implementation of the integration with the Central Bank to manage the collateral of the stablecoin .
3. Design of both the functional and technical architecture of the solution to be provided, including the integration with the Hedera Consensus Service (HCS), the token

standards, and the APIs for the different interfaces.

4. Development and implementation of the solution based on Hedera Consensus Service (HCS) and Hedera Token Service (HTS), including the testing and the technical deployment of the platform.

The final goal for this project is to fully understand the insights gained on several policy and regulatory challenges introduced by such innovation, along with promoting responsible innovation and providing regulatory clarity on financial technology innovation.

## TRANSFORMING WORKING CAPITAL THROUGH DIGITIZATION AND CONNECTED DATA

**LIQUIDX**<sup>®</sup>

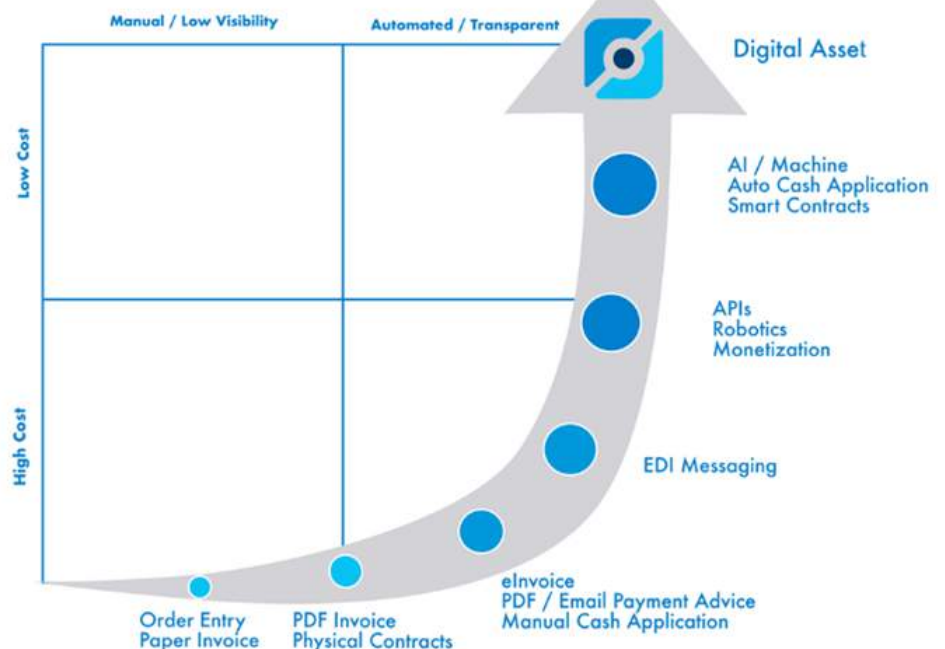
LiquidX provides leading technology solutions to automate and optimize the entire finance supply chain, including working capital, trade finance, and trade credit insurance. InBlock is the asset digitization engine leveraging Hyperledger Fabric to digitize and connect the Purchase Order, Inventory, Invoice, and associated workflows and cash records of the asset.

### The Challenge

The working capital process includes a significant amount of paper and manual processes that create cost and complexity. The accounts payable process must receive invoices from suppliers and digitize the invoices for goods receipt match and payment. The order-

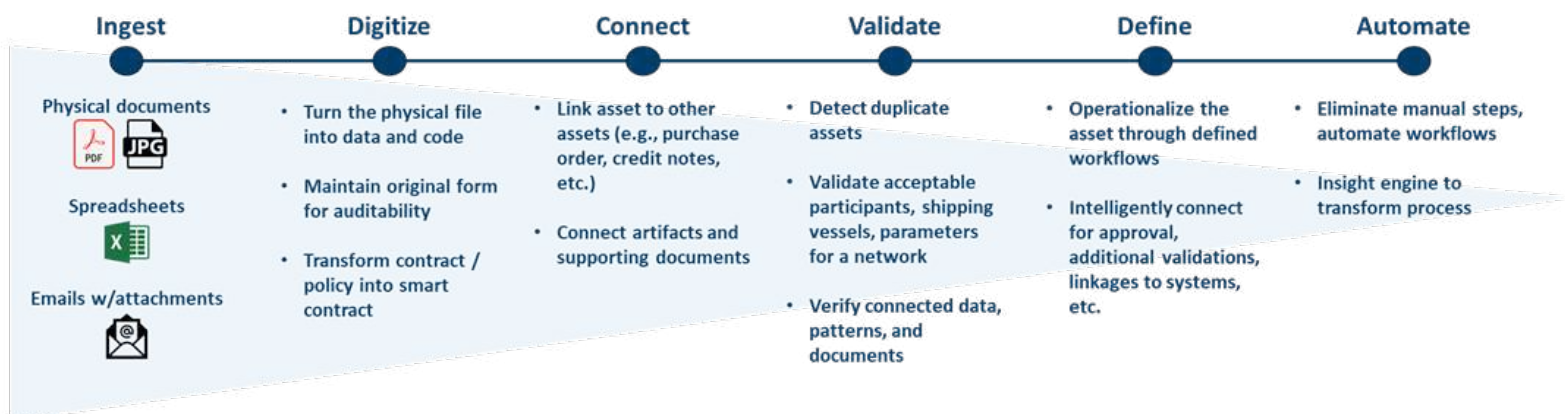
to-cash process must ensure a scalable way to receive and apply the cash to open invoices. The goal of a truly digital process is limited by the promise of automation through PDFs, which still require human interaction.

### The journey to the digital asset



In addition to the manual processes, traditional systems are single-facing, providing a current view only to their user. These systems lack the visibility across the network for order processing, shipment delays, returns, and disputes, creating manual, bespoke processes that utilize email and Excel spreadsheets.

## Digitizing and automating working capital with blockchain



### The Solution

InBlock leverages industry-leading technology that transforms the working capital processes for our clients, turning a physical invoice into data and recording the asset on the DLT. Whether the invoice arrived through a physical document or through our ERP adapters, InBlock can run the validation routines on the assets to detect duplicates, origination, etc. Once an asset is InBlocked, it can then be managed through our integrated workflows for AP, AR and Intercompany or financed through available programs. Our clients benefit from the real time updates to the cash flows, eliminating the manual effort of compiling the cash forecast.

Blockchain technology provides a shared ledger view where all participants have access to the most current state of the asset. Through smart contracts, we can connect and govern assets with their master agreements, policies, etc.

### The Results

Our clients experience real time, shared visibility to the AR, AP and Intercompany processes eliminating the manual chasing and reconciliation with their participants.

**3-5x**

RETURN ON INVESTMENT

**98%+**

AUTOMATED RECONCILIATION

**100%**

VISIBILITY TO TRANSACTION HISTORY, DEDUCTIONS, ETC





# NEXT-GENERATION INFRASTRUCTURE

## ACCELERATING VALUABLE DIGITAL IDENTITY ECOSYSTEMS



As governments and organisations accelerate their digital capabilities, identity must also be transformed. The pandemic has showcased how current identity systems create significant pain points across industries. Individuals and organizations can obtain greater value from moving to digital identity ecosystems, enabling users to use credentials across multiple organizations. With our lives growing increasingly digital, organizations need to understand their role within these new ecosystems to help create more efficient services and improve the user experience.

Together with the World Economic Forum (WEF), Accenture is advancing activities for digital identity ecosystems. In 2021, with support from over 50 organizations globally, we published “Digital Identity Ecosystems: Unlocking New Value” to assist and guide organizations providing valuable services to their users and drive global adoption, as governments, including the EU, UK, Australia, and others invest heavily.

Travel is a key digital identity use case. Recovery for the industry requires digital credentials that are accepted across borders. Lessons learned from The Known Traveller Digital Identity’s (KTDI) initiative can help the travel ecosystem lead the way to a more seamless and efficient experience for everyone, from bookings to arrivals. Accenture, alongside the WEF and KTDI partners, published “Accelerating the Transition to Digital Credentials for Travel” - for policymakers and industry leaders to guide global public-private collaboration. This summarises KTDI’s progress, presents best practices and outlines opportunities for multi-stakeholder collaboration to advance touchless border transformation and adopt digital travel credentials.

In 2022, Accenture is conducting research to explore impressions of, attitudes around, and behaviours influencing identity, privacy, and data sharing mindsets. The insights will help inform the path forward for adoption, as digital identity ecosystems become more commonplace in our lives.

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## INDUSTRIALIZING PUBLIC BLOCKCHAINS FOR ENTERPRISES



Public Blockchains, most importantly, the Ethereum ecosystem, were the engines of growth and innovation in 2021 and are likely to continue to be so in the future. Four distinct waves of innovation emerged in the public blockchain ecosystem in 2021 and they are likely to power sustained growth and innovation in 2022, all of them primarily built upon and focused around the Ethereum public blockchain:

**- Scalability with Layer 2 networks.**

Lingering questions about the scalability of Ethereum and the transition to Ethereum 2.0 have been answered in 2021. Layer 2 networks, from side chains to roll-ups, have ended fears that Ethereum cannot scale and promise enterprise users sustainable low-cost transactions.

**- Decentralized Autonomous**

**Organizations (DAOs).** DAOs are likely to be the future of business formation and operation, with hundreds of them being formed in 2021. We believe that in 2022, DAOs will increasingly take center-stage as a mechanism for funding and building new technology start-ups.

**- Non-Fungible Tokens (NFTs).** NFTs have arguably become the engine of consumer engagement in the blockchain ecosystem. From sports memorabilia to art, NFTs combine a sense of ownership with the creation of communities of interest. In 2022, their industrial and business applications will become more visible as well, as systems for managing supply chain assets and complex, unique financial instruments.

**- Decentralized Finance (DeFi) and Stablecoins.** DeFi grew immensely in 2021, fueled by dozens of innovative new financial services and enabled with widespread access to stable value fiat

currency tokens known as Stablecoins. In 2022, more new services will arrive along with much-improved regulatory clarity as central banks and regulators lay out the rules for fiat currency tokens and, in so doing, also start to clarify the role of possible central bank digital currencies that may prototype deployments in 2022 or 2023.

EY has continued our substantial investment in this space as the only Big 4 professional services firm with a focus on public blockchains, primarily Bitcoin and Ethereum. EY's key blockchain offerings include supporting financial statement audits by facilitating analysis of blockchain activities such as cryptocurrency transactions, as well as Ethereum ecosystem applications such as EY OpsChain for supply chain management, procurement, contract management, and asset traceability, all built for the public Ethereum ecosystem.

In 2021, EY continued its focus on contributing to, and building in the public blockchain ecosystem, including continued support for the Baseline Protocol and the Ethereum Enterprise Alliance. Additionally, EY started working with Polygon, including making all EY blockchain applications available on the Polygon Proof of Stake layer 2 network. EY is also supporting Polygon in its launch of Polygon Nightfall, a privacy-centric ZK-optimistic roll-up technology leveraging Nightfall 3 (a protocol originally contributed to the public domain by EY). Polygon expects a production launch of the Polygon Nightfall technology in calendar Q1 2022.

## DELIVERING TRUST INFRASTRUCTURE AT THE HEART OF THE MODERN ENTERPRISE



VMware Blockchain provides organizations and ecosystems with a foundational 'trust infrastructure' upon which they can build and scale multi-party applications to accelerate their innovation. VMware Blockchain delivers innovative technology that is also extremely robust, enabling enterprises to bring industry-transforming solutions to production even in highly regulated industries.

Taking a considered approach to blockchain, working deeply with customers who have the most demanding use cases, we bring computationally-assured trust to the distributed operations of customers (and their ecosystems) across a range of sectors – most notably in financial services, government, telco, and supply chain – each keen to leverage our robust platform to enable them and their partners with a shared, trusted, source of truth.

VMware Blockchain provides enterprise-grade features and robustness while staying true to blockchain primitives and maintaining the highest level of data integrity. Differentiating functionality includes granular privacy with data segregation, high performance and scalability, efficiency and Day2 operations (upgradability, reconfigurability, choice of on-premises and cloud-native deployment, and more), combined with 24x7x365 global support.

### Two leading customer exemplars in the financial services industry passed significant milestones in 2021

#### **Australian Securities Exchange (ASX) CHES replacement project and Synfini DLT-as-a-Service platform**

November saw ASX begin to invite external software vendors to test the workflows and connectivity across CHES+

access channels. CHES+, which is built on VMware Blockchain, will replace the existing system that underpins the entire Australian equities market for post-trade processing, including clearing, settlement, and registration.

The same month, ASX also started welcoming customers to Synfini, its new DLT-as-a-Service platform. Synfini provides access to the CHES replacement's underlying DLT infrastructure, data hosting, and ledger services – powered by VMware Blockchain – offered as a service.

#### **Broadridge Financial Solutions Distributed Ledger Repo platform**

Broadridge has leveraged VMware Blockchain to provide a trusted, shared, source of truth to develop a platform specifically designed for the challenging commercial and regulatory imperatives of the global repurchase agreement (repo) market.

Distributed Ledger Repo (DLR) allows for the immobilization of the underlying securities in the repo transaction while transferring ownership via smart contracts. By leveraging VMware Blockchain, DLR provides a synchronized and mutualized workflow with a single, real-time, always-accurate source of data available to all participants.

Looking ahead, the increased liquidity has the potential to benefit all market participants, not just those enjoying the efficiency gains garnered through DLR use directly, making Broadridge's platform a prime example of wider industry transformation through dedicated enterprise blockchain adoption.

For more information, please visit <https://www.vmware.com/blockchain>.

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## FOSTERING INNOVATION AND SCALABILITY ON THE ETHEREUM MAINNET FOR PRIVATE AND PERMISSIONED BLOCKCHAINS



The creativity of projects on Ethereum is exploding in areas such as decentralized finance (DeFi), non-fungible tokens (NFT), gaming, Web 3.0 and the metaverse. Ethereum's usage is at an all-time-high at over 184 million Ethereum addresses in existence and tens of thousands added each day. However, while high network usage signals strong adoption, it also points to a need for scalability and privacy-enhancing solutions.

With these goals in mind, ConsenSys engaged with Mastercard to co-develop key building blocks and launch ConsenSys Rollups to make blockchain technology scalable on the Ethereum Mainnet or for private use.

ConsenSys Rollups is an innovative modular software solution for permissioned blockchain applications focused on providing scalability and privacy capabilities that can be connected to any Ethereum Virtual Machine (EVM)-compatible blockchain. It can be used on the Ethereum Mainnet or on private ConsenSys Quorum networks. ConsenSys Rollups leverage zero-knowledge (ZK) proofs to protect specific transaction elements, such as account balances, sender, recipient, and amount, to prevent

this important transaction data from being shared publicly across the network – significantly enhancing the privacy and confidentiality of transactions. Zero-knowledge proof technologies enable one party to demonstrate their knowledge to another without having to share the actual information. In this context, it is used to verify and certify transactions without having to execute them on the blockchain network. Solutions built with ConsenSys Rollups can currently achieve a throughput of up to 10,000 transactions per second (TPS) on a private chain while only 300 TPS can be achieved on private chains and 15 on the Ethereum Mainnet.

Programmability on zero-knowledge rollups is designed to enable additional functionalities in the future. Even higher transaction throughputs are expected to be possible through reliance on trusted parties for data availability.

By increasing scalability and confidentiality for asset transfers, ConsenSys Rollups enables the implementation of new, innovative use-cases including Central Bank Digital Currencies (CBDCs), Decentralized Exchanges (DEXs), micropayments, private transfer, and taxes.



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## EVERTAS UPDATE

It seems every day we read about another hack, another loss in the crypto space. We also see increased regulatory scrutiny. Couple these issues with traditional and incumbent institutions trying to get into this space, and an ever-increasing retail interest in crypto, and the industry is poised for catastrophe. Imagine what would happen if there were widespread harm to retail customers or a major institution were to fail due to a loss.

While blockchain, DLT, crypto, web3, etc. is new, the problems facing it are not: it's a nascent industry with high risk and lack of clear standards that's rapidly evolving. The solution is an old one: insurance. Insurance provides for meaningful risk transference, maturation, professionalization, standardization, and facilitates growth for an industry; all things sorely needed by the crypto and blockchain industry.

# Evertas

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A robust insurance market, in addition to solving the issues above, has a number of additional benefits, specific to the crypto and blockchain industry. It allows more capital to enter the industry — for both risk and regulatory reasons a lot of institutions have not been able to invest (wonder why so few banks are in this space...they can't get insurance). The protection and quality control provided by insurance allows for broader retail adoption; while increased consumer protections and risk reduction will keep regulators and legislators at bay.

In 2017, Evertas started the first crypto and blockchain insurance company to address these issues and build out the last missing piece of critical infrastructure for our industry. After years of development, we have a dedicated crypto crime program backed by Reim and Lloyd's.

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## FILECOIN FOUNDATION UPDATE

One of the most important aspects of cryptocurrency is that it lets you program your money. In other words, you can write computer code that automatically transfers value upon a condition being met. The Filecoin protocol uses this programmable money concept to create a decentralized file storage network. If you have extra storage space on your computer hardware, you can "rent it out" to others who will pay you to store their files. A computer program regularly checks that the files are still being stored on your computer and, if so, automatically compensates you with cryptocurrency. In this way, the Filecoin network could be



a foundational technology for the next generation of the Internet.

Today's Internet is centralized. The vast majority of data making up the many websites Americans use every day sits in data warehouses owned by just three companies: Amazon Web Services, Microsoft Azure, and Google Cloud. We have repeatedly seen these companies suffer blackouts and vast swaths of the Web go down for hours, including websites that are massive contributors to the American economy. AWS's most recent outage in December is a prime example. That's the problem with having single points of failure.

On this decentralized web, websites will stay up even if some nodes fail, and the availability of information is not dependent on any one server or company. This provides a more robust platform for humanity's most important information.

Today, more than 3,600 Filecoin storage providers are contributing more than 14 exbibytes of storage capacity. To

put that in perspective, that could store all the written works of mankind in all languages from the beginning of recorded history to today more than 10 times over. Filecoin demonstrates how being able to program money — to instantly and automatically send microtransactions across the world — can create economic incentives that enable entirely new technologies.

## **BRIDGING THE GAP BETWEEN TRADITIONAL AND NASCENT HIGH-PERFORMANCE COMPUTE, WEB 3.0, AND THE DIGITAL ASSET ECOSYSTEM**



Web 2.0 was driven by developments in mobile internet, social networks, and cloud computing. The story of web 3.0 will unfold with new types of technological innovation, decentralized data networks, blockchain, artificial intelligence, and interoperability. Users and developers will be able to combine different programs and services from web 2.0 and 3.0 to customize how they use and build on the web.

In web 3.0, data will be stored on decentralized cloud networks and autonomous storage units. It will not depend on any centralized data hubs for providing information to users. The creation of powerful decentralized data storage systems is itself a very big challenge. Traditional cloud service providers are optimized for web 2.0 and hosting services based on virtualization; this model does not work for open source blockchains, which need access to hardware security ledgers, hardware keys, and related infrastructure, nor is existing infrastructure designed for flexible load data compute or hybrid high performance compute modeling, which are paramount for web 3.0 infrastructure.

Hut 8 is bridging traditional and nascent forms of high-performance compute, taking an unconventional approach to revolutionizing conventional assets, creating the first hybrid data center model that serves both the traditional high-performance compute (web 2.0) and nascent digital asset computing sectors and web 3.0. Hut 8 has established a Tier 0 to Tier 4 computing platform and allocated digital asset mining and open-source distributed ledger technology to conventionally underutilized areas in a conventional high performance compute data center.

The platform consists of approximately 400 commercial customers, across a variety of industry verticals including gaming, visual effects, and government agencies, and a platform for the development of applications and services to underserved markets and customers in the growing digital asset, blockchain, gaming, and web 3.0 industries. We envision a future of robust infrastructure offering to provide economies of scale, and economies of scope in the high-performance computing and the growing application development in web 3.0 and the digital asset ecosystem.

## CEFI AND DEFI: TOWARDS A DLT FINANCIAL SYSTEM



Today, the vast majority of cryptocurrency transactions happen on centralized financial (CeFi) platforms such as Coinbase and Binance, but we are seeing a growing shift towards decentralized financial (DeFi) protocols.

DeFi relies on distributed ledger technology (DLT), which removes the need for centralized intermediaries that would typically control order flow and settlement. DLT technology enables complex financial transactions and has the power to disrupt nearly every layer of the existing financial system, improving efficiencies and access while reducing counterparty risk.

Decentralized exchanges (DEXs) remain the most popular use case for DeFi and, since August 2020, more than \$600 billion in cumulative volume has been executed on the leading Ethereum DEXs. In 2021, DeFi attracted significant attention from traditional financial institutions, many of whom are actively researching and testing applications for this technology for post-trade processes.

Yet, as the transition to DeFi slowly emerges at various levels of the financial system, there will be a pressing need for interoperability between old and new finance. Today, this means ensuring that 'on-chain' data can be accessed in similar ways as 'off-chain' data, but tomorrow this means the two systems should be compatible and interoperable.

At Kaiko, our goal is to seamlessly bridge CeFi and DeFi markets so that we can accompany market participants throughout this transition to the new digital finance economy. This year, we launched our DEX Data Feed, the first data service that brings 'on-chain' data to 'off-chain' distribution channels. By extracting data directly from the Ethereum blockchain, we successfully built an interoperable data service with our centralized data feeds.

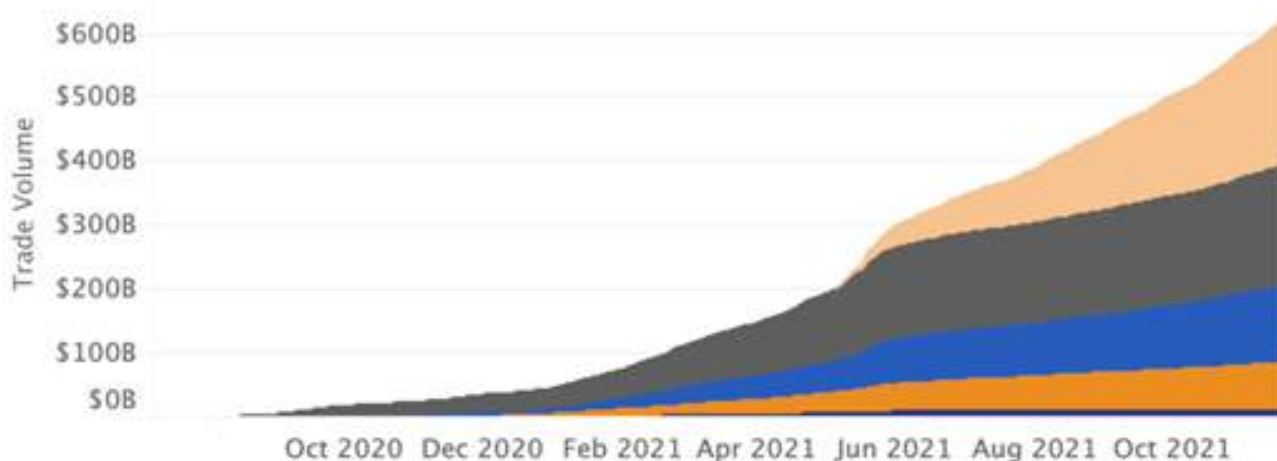
This is just the first step in building infrastructure compatible with a DLT financial system, a shift that we can expect to take center stage in 2022 as markets mature and the technology improves.

## Cumulative Traded Volume on DEXs

Since August 1st, 2020



Uniswap V3    Uniswap V2    Sushiswap    Curve    Balancer V1



## HOW CRYPTO MARKETPLACES CAN ACHIEVE INSTITUTIONALIZATION



As digital assets are growing in popularity, regulations governing this new asset class are reacting to the rapid expansion. For digital assets and cryptocurrency marketplaces to gain the trust of regulated entities, they must prove they can meet the requirements of institutional investors with ample technology, controls, and processes to protect investments. Two critical areas to address are reliable and scalable infrastructure and market integrity controls.

### Reliable & Scalable Infrastructure

Cryptocurrency markets are almost always on, with many trading 24 hours a day, seven days a week, 365 days a year. With the ability to access the markets at any point in time, the exchange infrastructure must be able to support spikes in volatility. For example, Bitstamp implemented Nasdaq's technology, finding that the upgrade "imparted a clear change in the capacity to handle a large number of trades over a short amount of time." In addition, new features such as additional asset classes, more pairs for existing assets, and new order types allow Bitstamp to bring new products to market faster and meet the needs of their evolving customer base.

### Demonstrable Market Integrity

Fairness, transparency, and market integrity are the cornerstones of inspiring confidence in emerging markets. Incorporating surveillance into an exchange's infrastructure ensures that the market is detecting and preventing potentially manipulative behavior, encouraging greater participation from institutional investors. Ten crypto exchanges are leveraging Nasdaq's surveillance technology with real-time 24/7 monitoring of up to 60 billion transactions per day. Nasdaq's surveillance strategy is tailored for crypto and digital assets exchanges, including the ability to monitor currency pairs and fractional volumes.

### Nasdaq's Marketplace Services Platform

The Nasdaq Marketplace Services Platform provides cryptocurrency and digital asset exchange operators with a SaaS-based platform to support high volume trading while protecting exchanges from manipulation with comprehensive surveillance monitoring capabilities. Visit our website to learn more. <https://www.nasdaq.com/solutions/cryptocurrency-exchange-software>

## Marketplace Services Platform Benefits



### HOSTED & OPERATED BY NASDAQ

Delivered in the cloud region of your choice



### FRICTIONLESS ON BOARDING, CONSISTENT SUPPORT

Decrease friction getting to market, provisioning infrastructure in weeks and months over longer horizons.



### QUICK TIME-TO-MARKET

Unified customer care model across all services



### BEST-IN-CLASS SECURITY PROTOCOLS

Established and proven infosec standards from Nasdaq, and some the worlds' most demanding geographies and markets



### FLEXIBLE CONSUMPTION MODEL

Subscribe to a single service or many or integrated suites to reduce complexity



### CONTINUOUS ENHANCEMENT

Frequent release cycles continuously enhance performance and functional depth



### GROWS WITH YOU

Ability to scale, add services & expand ecosystem over time

## ENHANCING SMART CONTRACTS CAPABILITIES USING LAYER-3 ARCHITECTURE



Blockchain design choices lead to inherent tradeoffs between key features such as security and scalability. This leads to the creation of “blockchain stacks” consisting of separate layers complementing each other to achieve an optimal decentralized infrastructure.

The typical blockchain stacks consist of 2 main layers: A base infrastructure security layer (L1), such as Ethereum, and a second scalability layer (L2), such as Polygon or Arbitrum.

Existing L1 and L2 infrastructure chains are, generally, implemented as Ethereum Virtual Machine (EVM) smart contracts. These smart contracts are powerful in securing and processing value but are limited in their capabilities.

Adding another decentralized layer on top, which we can refer to as an L3, can enrich the capabilities of EVM-based L1 and L2 smart contracts. This can open the door for an innovative new breed of capable decentralized applications that would be very relevant for DeFi, NFT, Gaming, and Metaverse industries.

With its unique hybrid architecture, permissionless blockchain infrastructure

and enhanced smart contracts capabilities, the Orbs Network is designed for interoperability with EVM-compatible blockchains and can serve as that L3 execution layer, operating in conjunction with EVM-based L1s and L2s, as part of a rich and complete blockchain stack.

Let’s consider a specific example, the DeFi space:

A successful type of DeFi protocol is a vault, such as Yearn Finance. The strategies employed by vaults are popular and effective, yet simplistic, since they are implemented as EVM smart contracts. L3 architecture would let vault developers implement smarter strategies, (e.g., react to off-chain events, change positions depending on APY, or optimize leverage). This dynamic infrastructure would allow vaults to employ smarter strategies and generate better yields.

Orbs is a decentralized protocol executed by a public network of permissionless validators using PoS.

Learn more about Orbs as a Layer-3 architecture: <https://www.orbs.com/>





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## BUILDING DIGITAL ASSET INFRASTRUCTURE IN SINGAPORE



As the demand for cryptocurrencies continues to grow, institutional investors are increasingly developing capabilities to invest and trade in digital securities to reap the benefit and advantages offered by new technologies such as Distributed Ledger Technology (DLT).

The Singapore regulatory framework and business ecosystem are well placed to position the country as a hub for financial innovation, leveraging blockchain technology and digital assets.

In 2021, SBI Digital Asset Holdings Co., Ltd. ("SBI DAH") made significant inroads into launching two of its major initiatives in this space in Singapore.

First, SBI DAH launched SBI Digital Markets Pte. Ltd. ("SBI DM"), a subsidiary with an ambition to become a top-tier digital asset business for financial institutions based in Singapore. SBI DM is set to directly target the growing demand for public and private institutional digital assets by providing institutional services, including issuance, corporate advisory, and custody of digital assets. In 2021, the

company onboarded its core team and is currently engaging with the Monetary Authority of Singapore ("MAS") to obtain the required regulatory approvals to deploy its strategy with a go-live target in 2022.

Second, SBI DAH continued to jointly develop Asia Digital Exchange Pte. Ltd. ("ADX"), a JV with the SIX Group aiming to become the digital asset exchange venue of choice for institutions. The venue will provide the key foundation and infrastructure for the SBI ecosystem in the region, with a planned future integration with SIX Digital Exchange ("SDX") and the upcoming exchange to be developed in Osaka by the SBI Group.

Both companies will play an active role in developing an end-to-end global ecosystem for both investors and issuers that will leverage the extensive network of the SBI Group by collaborating with SBI's portfolio companies such as B2C2 - acquired by the group earlier this year - Sygnum, and Boerse Stuttgart Digital Exchange, among others, as well as with partner firms such as the SIX Group.

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## MITIGATING CRYPTO-RELATED RISKS AND ENABLING SAFE CRYPTO TRANSACTIONS THROUGH A PREDICTIVE CRYPTO RISK & INTELLIGENCE PLATFORM



As institutional adoption of digital assets reaches an all-time high, financial institutions of all sizes are most likely exposed to crypto risks — whether directly or indirectly. At the same time, criminals are becoming increasingly sophisticated and successful in using crypto for illicit activity. For businesses, this means a rapidly rising cost of compliance, only outpaced by increasingly massive fines for non-compliance.

Current AML/CFT tools in the market are overly dependent on blacklists and historical data, making them insufficient in helping businesses manage their full range of transaction risks. In order to address this gap, Merkle Science has built a comprehensive suite of tools to help businesses understand and mitigate crypto-related risks, even those that were previously undetected, so businesses may focus on what they do best — building the future of finance.

**COMPASS** — Merkle Science’s proprietary predictive blockchain transaction monitoring platform combines continuous monitoring of known bad actors with our predictive behavior-based rule engine in order to identify criminals who operate beyond the blacklist. Through its depth of functionality and customizability, Compass empowers you to navigate ever-evolving local and global regulations.

**TRACKER** — An enhanced blockchain investigations tool that enables government agencies, crypto businesses, and financial institutions to better visualize, investigate, and identify transaction patterns that are not visible on address-based forensics. Tracker’s powerful analytics and algorithms allow

for forensic analysis on a cluster of cryptocurrency addresses at the same time, resulting in better collaboration and accuracy.

**EXPLORER** — Supports the in-depth analysis and understanding of blockchain businesses through our Risk Score. The Risk Score computes and analyzes a number of inputs, including on-chain analytics, off-chain data, security, jurisdictional risks, executive teams, and licensing.

**INSTITUTE** — Learn about crypto-related risks from crypto crime investigation and compliance experts.

## The predictive crypto risk & intelligence platform

### COMPASS

- Meet AML & KYC regulatory compliance obligations
- Use behaviour-based monitoring to go beyond the blacklists
- Identify suspicious transactions & criminal wallets



### TRACKER

- Forensically investigate financial crime
- Visualise and track stolen crypto funds
- Identify exit nodes and crypto criminals
- Take expert evidence-based action

### INSTITUTE

- Learn from the crypto crime investigation & compliance experts
- Tailored courses & certifications for law enforcement agencies, investigators, regulatory bodies & compliance officers
- Upskill & improve your ability to detect, investigate and prevent crypto crimes

### EXPLORER

- Fully understand your retail and corporate crypto exposure
- Identify & perform due diligence on crypto businesses and customers (KYBB)
- Flag risky transactions & generate risk reports (EDD)

# INVESTING IN THE FUTURE

## MODERNIZING COMMODITY INVESTING THROUGH TOKENIZATION

## ATOMYZE

Atomyze LLC is building a tokenization platform and marketplace that uses blockchain technology to improve the way investors can access commodities. Some commodities, such as precious and base metals, come with a high cost of acquisition and ownership due to challenging logistics, inefficient pricing, and risk. Current commodities investing and trading products suffer from

decades-old designs and are complicated to manage, undermining intended risk exposure. Further, many commodities are illiquid or unavailable to investors. By transferring the process to the blockchain, investors have improved access to the investment, and owners of the physical commodities have a better way to manage the selling and storage process.

## ATOMYZE

### Investor benefits



Direct title and immediate access to physically deliverable, allocated metal.



ESG ready – tokens will eventually be able to identify the origin, provenance and other sustainability related traits of the underlying physical asset.



Direct ownership gives exposure to spot price without the risks associated with derivative metal products such as credit risk or futures roll risk.



Tokens are digital assets that can be traded, transferred and settled instantly on the Atomyze platform on a 24/7 basis.



Privacy and security are maximized with the use of a permissioned blockchain. All participants undergo rigorous KYC/AML procedures. Tokens cannot be removed from the platform.



Efficiencies of tokenization will allow for physical ownership of a broad range of niche metals not currently accessible on traditional futures exchanges or via exchange traded products.

Atomyze will provide investors access to commodities through tokenization: digitizing ownership of physical assets, such as palladium, via the blockchain. This provides investors digital title with direct ownership to that physical asset. In addition to direct title, the benefits of tokenization include improved liquidity through expansion of market participants, reduced operational risk, and increased trading efficiencies, such as instant settlement, and enhanced security. Tokens are 100% collateralized by the underlying assets, regularly audited and attested by top tier auditors. Additionally, blockchain and tokenization offers enormous potential to track

environmental, social, and governance (ESG) metrics that are so important to investors today. In the future, Atomyze will integrate metadata within a unique token so that market participants will be able to track the origin of the asset.

Further, Atomyze is creating a platform that connects the entire ecosystem —producers, commodity owners, investors, traders, merchant bankers and commercial users. There is a need for a modern commodities trading and investment platform that will improve the management of supply chain contracts and create real access and liquidity for all market participants.

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## GENESIS GLOBAL TRADING



Genesis is a global leader in institutional digital asset markets, facilitating billions in trades, loans, and transactions on a monthly basis.

Genesis has the distinction of launching the first OTC digital asset trading desk in 2013. The company launched its lending platform in 2018 and its custody and derivatives business lines in 2020.

The Genesis derivatives trading desk is a principal liquidity provider backed by our lending business, Genesis Capital, that actively quotes institutional-sized blocks in options and futures across all major crypto exchange venues (including Deribit, CME, and ICE/Bakkt).

Our derivatives desk offers bespoke bilateral OTC derivatives solutions with certain eligible counterparties, giving them the ability to trade a wider range of assets such as BCH, BSV, LTC, EOS, XRP, and XLM, alongside more customized expirations, strikes, and settlement types to express views and manage risk.

Our derivatives desk is currently the #1 crypto derivatives desk by volume and serves as a liquidity provider and hedging partner for many of the largest participants in the industry. We traded \$20.7 billion in derivatives notional volume during 4Q2021 alone, and \$53.8 billion for the full year 2021. Volume has grown more than 9x YoY since 2020.

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## THE RIGHT PATH TO SUCCEEDING AS A FINTECH



Blockchain became a buzzword in 2009. Since then, there has been an increasing interest from the financial sector due to the massive growth of financial

institutions around the world adopting blockchain technology.



Although traditional banks and other incumbent financial players are adopting blockchain, the real potential for disruption comes from FinTechs that can use blockchain technology to displace legacy systems. There are currently around 10,700 FinTechs in the USA, 9,300 in the Middle East, Europe and Africa, and 6,200 in the Asia-Pacific region.

However, 3 out of 4 FinTechs supported by VCs fail due to compliance issues, price competition, and inadequate business models.

7CC Blockchain Investments seeks to address the 75% failure rate of FinTechs by investing early, lending capital, and advising high-growth blockchain FinTechs so they can achieve their full potential. Consequentially, 7CC provides:

- **Early-Stage Equity Investments:** Once the startup has shown a proof of concept, 7CC can provide additional resources, including capital in the form of pre-listing token purchases.
- **Blockchain Token Issuance Advisory Service:** Token Offerings, campaign management, legal support, tech development, marketing, and operations (regarding token offerings)

in return for discounted pre-listed tokens.

- **Research LAB:** 7CC invests in the development of Blockchain Proofs of Concept (POCs), with a focus on B2B and Public-Private Partnerships. Successful POCs are then built — in partnership with Universities and Research Centers — and mature into patents which, in turn, will be either acquired by investors or commercialized via BAAS models and royalties.
- **Strategic Partnerships:** Collaboration with blockchain organizations in Singapore, USA, EU, Kazakhstan, Hong Kong, Moscow, Uruguay, Argentina, and Brazil, which give FinTechs access to global resources.

At 7CC Blockchain Investments, we believe that increasing the range of investment opportunities for retail and institutional investors, as well as encouraging regulators to understand blockchain technology, will allow traditional financial markets to be developed in harmony with disrupting FinTech models, thus offering new products and innovative services.

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## A DIGITAL FINANCE PLATFORM FOR THE FUNDING, MANAGEMENT AND COMPLIANCE OF CLIMATE AND INFRASTRUCTURE ASSETS



To win the fight against climate change, “finance” and “climate” need to speak the same language. While Environmental, Social and Governance (ESG) awareness is at an all-time high, and sustainability-linked bonds have grown from \$50 billion to \$1 trillion in issuance since 2018, significant gaps remain in identifying, collecting, synthesizing, and reporting climate data in the world of finance.

Blockchain Triangle (BCT), a portfolio company of A100x, solves for this by integrating finance and climate data on one chassis. Its managed platform uses Big Data as the common language, so that all stakeholders can assess and analyze the true impact of climate assets. BCT technology democratizes investor access to the \$4 trillion earmarked for climate assets and to the opportunities that come with transitioning to the \$90 trillion distributed climate-resilient economy.

To achieve this transition, BCT supports climate compliance requirements for both existing and new assets. It connects smart meters and IoT devices to securities via blockchain and, in doing so, creates a pathway of real-time asset performance to diverse stakeholders such as investors, credit rating agencies, and insurance companies. Ultimately, this transparency lowers financing and operating costs by:

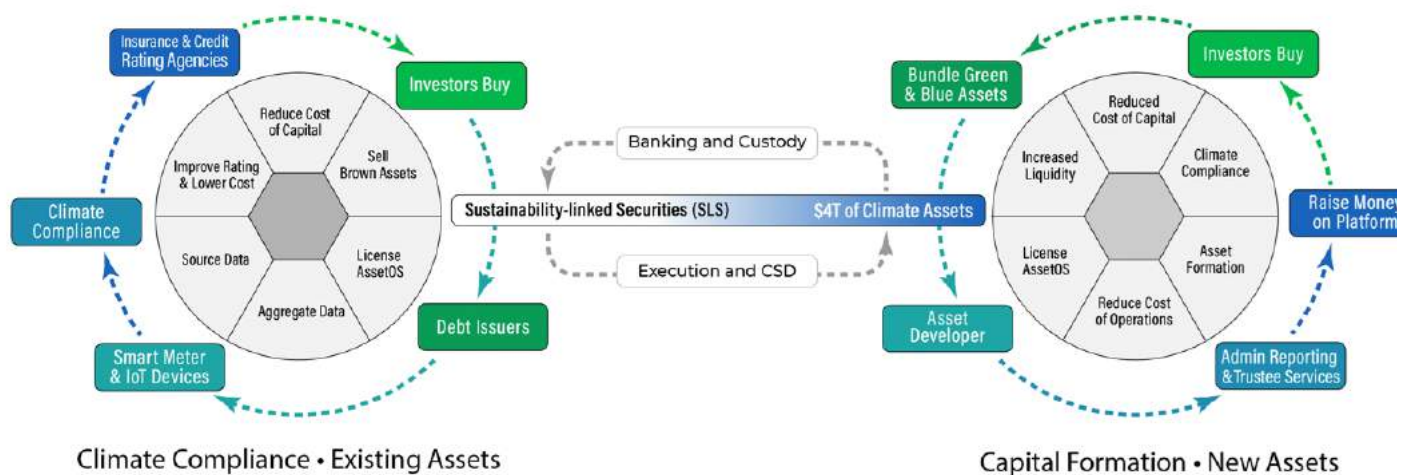
- Enabling investors and credit rating agencies to see the accurate and reliable source data necessary to meet ESG mandates.

- Bundling assets to create a lower cost of capital.
- Defining real-time operating performance of an asset, lowering administration, reporting, and trustee service costs.

At COP26, BCT forged a new frontier for Sustainability-linked Securities for sovereign debt. By leveraging the \$100 billion UN fund, BCT can provide governments the necessary framework to aggregate climate reporting data. This market-based solution relies on science and math to remove the guesswork in delivering ESG awareness and achieving climate transformation.

## INSTITUTIONAL ECOSYSTEM FOR \$90T CLIMATE RESILIENT ECONOMY

### Traditional & Digital Assets (DLT)



## CALASTONE UPDATE

Calastone, the largest global funds network, connects 2,900 of the world's leading financial organisations across 52 countries and territories, and processes £200 billion of investment value every month. Calastone's mission is to reduce complexity and drive out risk and cost for all fund participants.

## CALASTONE

In 2019, Calastone introduced its Distributed Market Infrastructure (DMI) combining the connectivity of its global network with the very latest technologies, including distributed ledger technology (DLT). From this unique base infrastructure, Calastone has created DMI Fund Services, a suite of services that enables transfer agents,

fund managers, and fund distributors to transform how they service and interact with their clients and lower the overall cost of investing.

Initially, DMI Fund Services will provide a complete transfer agency technology solution, enabling transfer agents and fund administrators to digitalise their core activities and achieve their strategic business transformation goals on a fully digital, real-time, and distributed register. The solution can be adopted through the existing connectivity that Calastone already offers, ensuring that participants can access its benefits at a pace or through any method that works for them. By giving all participants permissioned, real-time access to the register, firms can grow their businesses by delivering enhanced levels of client

service, facilitating new investment models, and by operating at a fraction of today's operating cost.

The impact Calastone's DMI-driven fund administration infrastructure can have on cost efficiency is significant. Through the automation of key processes, over 50% of cost efficiencies can be generated as illustrated by the diagram below. Beyond this, Calastone is developing the infrastructure to support a future-state tokenised model for funds and beyond. This enables Asset Managers to issue, administer, and distribute entirely new tokenized investment vehicles at a lower cost and with greater speed than is possible in today's model.

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## DEMOCRATISING OWNERSHIP TO ART AND OTHER INVESTMENTS



In November 2020, Sygnum launched its end-to-end tokenization solution, comprising Desygnate, a primary market issuance platform, and SygnEx, a secondary market trading venue. This fully integrated, institutional-grade tokenization offering enables issuers to create unique investment opportunities for investors by connecting them seamlessly in one platform.

Representing a landmark in the convergence of global public and private markets, investors can now profit from asset classes previously seen as hard-to-access in a direct and fractional manner, including Venture Capital, Mid Cap, Real Estate, and Art & Collectibles, all of which are made investible through tokenization, a blockchain-powered alternative to traditional asset securitisation.

Since then, Sygnum has tokenized a range of assets, including Picasso's Fillette au b ret painting, and CryptoPunk #6808, a non-fungible token (NFT) on the Ethereum blockchain. These are two vastly different pieces of art – one a traditional oil painting by a twentieth century master, and the other a 24x24 pixel art image generated using a computer algorithm. However, both are considered blue-chip art with significant potential for return.

By tokenizing the Fillette au b ret and CryptoPunk #6808, Sygnum makes co-ownership of these two artworks possible, lowering the financial barrier and democratising access to art investment. Combined with a legal structure that ensures ownership rights are recognised under Swiss law, this innovative technology has the potential to open up the global art market, and other investment verticals, to a broad range of new investors.

## VALID SCORE: THE SECURITY STANDARD FOR THE CRYPTO WORLD



Daily attacks and hacks make it evident that blockchains and cryptocurrencies are NOT safe. Malicious hackers and human errors cost billions of dollars a year in fraudulent crypto transactions and lost value. Investing in crypto and DeFi projects is risky and often feels like betting. Valid Network is here to change that.

Valid Score - the new standard for digital assets' security and reliability - gives crypto traders and institutional investors a clear risk rating and predictive insights on asset safety, governance, and reputation, for thousands of digital assets and vaults. It provides a clear indication of the risk posture of any cryptocurrency, or entire portfolios, so you can invest with confidence, hedge against risk, and maximize profits. You can also dive deep into the Valid Score to get on-chain data capabilities and understand the dynamics of any crypto asset: security, key stakeholders, permissions, and more.

Our award-winning cybersecurity and intelligence technology helps crypto investors, traders, and funds make informed decisions, with less risk and more visibility to new opportunities. We've been recognized as innovators by both Gartner and CB Insights in various reports over the past year! Through continuous monitoring of blockchain networks and AI-powered deep analysis, we generate predictive and real-time insights on assets' reliability and security.

Our Valid Score actually generates Alpha! Our predictive Valid Score demonstrated proven Alpha with 95% confidence: Digital assets with higher Valid Score generate better returns over time and lower drawdowns. Assets suspected to be volatile receive a lower Valid Score. None of the highly-scored assets demonstrated negative returns.

Valid Score can be easily integrated into any exchange, project website, financial model, or BI tool using a web-based widget or RESTful API.







# NFTS AND THE METAVERSE

## COMMERCE INFRASTRUCTURE FOR THE METAVERSE



Boson Protocol enables the sale of physical products as NFTs. Boson creates a commerce bridge between the virtual and real worlds, so brands can offer new experiences that improve customer engagement in both.

Imagine if your customers could browse your products in the metaverse, then receive the physical items on their doorstep or collect in-store. Our vision at Boson is to provide the decentralized

network upon which future commerce will run. And it starts with the metaverse.

Boson Protocol raised \$36m on the promise of decentralizing commerce, a hard problem that offers a trillion-dollar opportunity. We're right on track to deliver on that promise.

In Q4 2021 we released v1 of our protocol on Ethereum Mainnet and the first step in our go-to-market



strategy – Boson Portal in Decentraland. Built on Boson Protocol, Boson Portal enables brands to sell physical goods in the metaverse as NTFs within our experiential space in Decentraland. We have released fashion drops by Web3 brands MetaFactory and Auroboros with plenty more to come in 2022.

We also launched the Boson Protocol Gallery in Decentraland featuring The Glass Suit by Dolce & Gabbana, which we purchased for 351 ETH, making NFT and fashion history; the suit will be auctioned on v2 of our protocol later this year. Our metaverse commerce product will enable brands to sell physical products in multiple metaverses, directly from existing eCommerce channels.

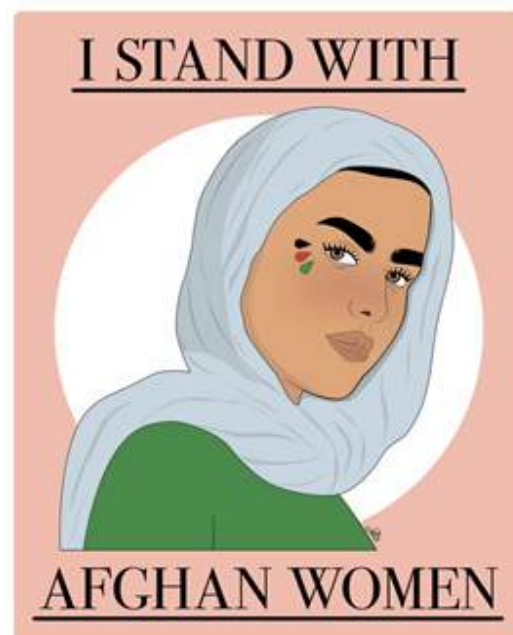
## POA STUDIOS UPDATE



PoA Studios cofounder Heidi Pease began working with young Afghan women through collaboration with University of Southern California Viterbi School of Engineering, LA Blockchain Lab, which she also cofounded, and Roya Mahboob’s Digital Citizen Fund back in 2019. The program’s mission was simple: help teach blockchain technology and coding languages to Afghan teachers, who then taught small classrooms of girls. They learned how to code, work on software projects, and make money in crypto, predominantly in Herat, Afghanistan.

Fast forward to August 2021. The fall of Afghanistan to the Taliban and withdrawal of US troops created uncertainty and fear, but also a fierce determination for many of these young women. PoA Studios is doing its part to support the women and girls of Afghanistan by participating in the “I Stand With Afghan Women” project. PoA Studios is minting carbon neutral NFTs for Afghan women artists, like Zelo, to showcase their artwork, raise funds, and show solidarity with continued support of on-the-ground learning and classes, helping refugees overcome new challenges. The initial auction sale will occur in early March and run as a series over the course of 2022.

Beyond minting NFTs and raising funds for important social impact causes like the “I Stand with Afghan Women” project, PoA Studios is committed to education and helping the creator community understand how digital tools like the token economy and NFTs can empower artists of all walks of life, verify ownership, and bring fans and patrons closer to the creator. By harnessing people power, PoA Studios is committed to helping those artists and creators achieve unique artistic expression, social impact, and environmental goals. We collaborate, build, and come together, in tragedy and sorrow, to lift each other up with respect and appreciation.



## BLOCKCHAIN-BASED SERVICE NETWORK LAUNCHES NFT INFRASTRUCTURE IN CHINA



A non-fungible token (NFT) is a digital certificate or a unit of data stored on the blockchain. Owing to its uniqueness and indivisibility, NFT technology is widely used in digital art and copyrighted content. However, its potential use cases go well beyond what we see today in the art world. Technically, NFT technology can be applied to any scenario where digital proof is required, from collectible ownership and IP of creative works to documentation, such as ID cards, academic certificates, and real estate ownership documents. The technology can be used to verify the authenticity of documents while also preventing them from being tampered with or stolen, as well as facilitating verification, confirmation, and tracking.

However, most NFTs today are minted on public blockchains that are not allowed in the Chinese market. To support NFT technology development in China, the Blockchain-based Service Network (BSN) has converted public chain technologies to “open permissioned blockchains”

(OPBs) to overcome the regulatory hurdles in China.

These OPBs replace cryptocurrency with fiat currency to pay gas fees and require permission for node deployment. To dispel the current association between public chains and cryptocurrencies, NFT has been renamed to Decentralized Digital Certificate, or DDC for short.

The BSN-DDC network is a digital certificate infrastructure network on BSN China that includes over 10 OPBs. BSN-DDC offers network access, core APIs, and SDKs – a one-stop-shop for businesses to develop user portals or apps for all types of NFT applications. All payments and transaction fees are paid in fiat currency via BSN-DDC portals. BSN-DDC encourages digital certificate usage beyond the field of art and entertainment collectibles with support for all types of digital certifications, documents, tickets, identification, intellectual property, and more.

### BSN-DDC Ecosystem

#### DDC End-Users

Use DDC applications in a specific scenario



#### Business

Ticketing systems, educational institutions, cultural and creative enterprises, government departments, etc. that require digital certificates



#### BSN

Provide the infrastructure for DDC Network; Endorse BSN official distributed digital certificates



#### BSN OPBs

The BSN-DDC Network is composed of more than ten blockchain frameworks



#### Platform/Portal

Generate distributed digital certificates and provide management services for end-users and developers





The BSN-DDC network currently is the most diverse, transparent, affordable, and user-friendly blockchain infrastructure that supports the legal

deployment of NFTs within China. It officially launched at the end of January. to support the mass adoption of NFTs in China.

## SENSORIUM UPDATE

Founded in 2018, Sensorium is one of the leading contenders in the metaverse race, alongside tech giants like Facebook, Microsoft, and Epic Games. AAA-metaverse Sensorium Galaxy will feature immersive high-end experiences, ranging from exploration of extraordinary virtual worlds to games and self-improvement practices to shows performed by chart-topping artists, including David Guetta, Armin van Buuren, and Eric Prydz, among others. At Web Summit 2021, Sensorium announced yet another ground-breaking partnership with the godfather of electronic music Jean-Michel Jarre, who will sound engineer MOTION, Sensorium's mindfulness-themed virtual world.

Working towards the decentralization of its product, Sensorium recognized a growing demand for an NFT-focused blockchain geared towards the needs of the entertainment industry. In October, the company introduced its second major product – Wakatta – a



blockchain that pioneers upgradable, time-limited, and non-hashed NFTs and offers one-click integration even for non-crypto-savvy companies. All these solutions facilitate digital collaborations and offer artists and brands new ways for unleashing their creativity and building additional revenue streams.

While Sensorium Galaxy will be the first player to benefit from Wakatta's innovative solutions, more entertainment industry leaders have already announced their plans on integrating the new blockchain. Among them are Roborace, the world's first motorsport competition of full-size AI-racing robots in mixed reality, and .ART, the art world's top-level domain that unites over 150,000 artists, institutions and brands, including the Louvre, the TATE museum, the Marina Abramovic Institute, and the Louis Vuitton Foundation.

**W** / **.ART**





Throughout 2022, as the NFT market is set to continue growing at double-digit rates, Wakatta plans to launch its incentivized testnet and expand its

partnership portfolio, enabling more entertainment companies to benefit from its innovative NFT-based solutions.

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## AVENTUS UPDATE



2021 was a massive year for NFTs and metaverse. This traction did not catch us by surprise given the level of attention they received in the previous year. There were multiple metaverse environments launched, which led to a monumental amount of NFT transactions in marketplace sales, NFT exchanges, and within virtual reality environments.

One of the main selling points of NFT technology is its ability to prove custody and, because it's powered by a technology built around immutability, this custody is backed up by undeniable provenance data with robust timestamping. Hence, 2021 saw a shift in thinking, with more companies exploring the value of NFTs beyond artworks and towards security and uniqueness.

Aventus is a customisable layer-2 blockchain network that lets you build on Ethereum at scale to process transactions at 100x the speed and 1% of the cost, and based on this foundation, we designed NFTs to be minted and transacted at 1% of the cost on Ethereum and, in some cases,

even less. A significant portion of 2021 was devoted to supporting companies with minting NFTs and transacting NFTs in both marketplace and metaverse environments.

VereNFT is one such example of a company that manages its NFTs via the Aventus network. VereNFT is a white-label marketplace solution that provides companies with a custom-built marketplace to mint and manage NFTs. NFTs minted and purchased via these marketplaces can also be used within the metaverse via the Aventus Gateway API. Furthermore, these NFTs are minted on the Aventus network but are not locked on the network, as Aventus is interoperable with Ethereum.

If the increase in NFT sales and trading volume between 2020 (\$33,000,000) and 2021 (over \$13 billion) is any indication of what should be expected in 2022, we envision that there will be a lean towards platforms that can offer scalability, interoperability, and reasonable transaction costs.

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## TOKENS.COM UPDATE



Tokens.com is a publicly traded company that invests in Metaverse, DeFi, and NFT-based digital assets. Through a process called staking, Tokens.com's inventory of crypto assets is used to earn additional tokens. Currently, Tokens.com has an inventory of cryptocurrencies, including Ethereum, Solana, Polkadot, Terra, Shiba Inu, Oasis Rose, and Ankr.

Tokens.com is also the majority owner of Metaverse Group. Metaverse Group is a vertically integrated NFT-based metaverse real estate company. The group, with its global headquarters in Decentraland's Crypto Valley, also owns an eight-figure real estate portfolio across many leading virtual worlds. Metaverse Group intends to continue

to purchase, develop, and rent out its portfolio of real estate assets.

Tokens.com is in the process of developing the Tokens.com Tower in Decentraland's Crypto Valley, which will serve as an innovation hub, with the potential to hold crypto metaverse conferences and provide business office rental spaces. In addition to providing opportunities to build companies' presence in the metaverse, Tokens.com provides shareholders exposure to metaverse NFT-based real estate assets.

Tokens.com's mission is to connect public market investors to the most exciting growth areas in crypto - the

Metaverse, DeFi, and NFTs - in a safe and secure way. Tokens.com takes away the hassle of owning multiple crypto wallets, staking personal collections of tokens on multiple platforms, and navigating the growing virtual real estate market.

Through our publicly traded shares, investors have a simple and safe way to get exposure to crypto and blockchain. Our shares trade in Canada on the NEO exchange under the symbol COIN, in the US OTC market under the symbol SMURF and on the Frankfurt Exchange under the symbol 76M. Since listing on April 30th, 2021, Tokens.com's shares have appreciated by over 150% year-to-date.





# SUSTAINABILITY AND RESILIENCE

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## COLLABORATION IS THE KEY TO RESPONSIBLE SUPPLY CHAINS



From mitigating delays in holiday e-commerce deliveries to an intensified global drive toward Net Zero emissions, the need for more effective supply chain management continues to permeate every corner of our lives. As we turn the page on another year, we are excited by the strengthened attention and investment that supply chains have attracted as leaders shift their operations to become more Resilient, Relevant, and Responsible.

There is clear consensus that progress toward improved supply chain sustainability demands ecosystem-wide cooperation to achieve the necessary magnitude of societal value. At Accenture, we work alongside our clients to leverage blockchain and multiparty systems as a key enabler to deliver on the promise of Responsible Value Chains.

Over the past year, we have worked with our clients to create more transparent supply chains through network-based solutions to better monitor ESG performance. By creating

decentralized platforms to issue and store sustainability credentials, supply partners and 3rd party data providers can collaborate to reduce duplicated manual effort and improve ESG visibility.

By working collaboratively across supply partners, we are helping to provide n-tier visibility at a component/commodity level – from raw material to finished goods. As downstream buying entities are increasingly held accountable for the behavior of their upstream supply chain, the ability to track changes in product attributes through complex supply networks is crucial.

Lastly, we are seeing continued interest in sustainability-focused control tower capabilities that provide dynamic decision-making to procurement and supply chain departments – allowing them to optimize the mix of suppliers and logistics movements to balance order fulfillment and environmental impact.

Sustainability is here to stay as a key

imperative for global supply chains. We are confident that 2022 will see lasting impact and continued maturation from collaborative supply chain networks who

are leveraging the power of collective effort to improve sustainability outcomes.

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## ENVIRONMENTALLY SUSTAINABLE TECH FOR LONG TERM VALUE



Over the past year, as many blockchain protocols faced valid public scrutiny for the environmental harm of their consensus algorithms, Algorand set a new industry standard for sustainability. Designed from the outset to require minimal computation and create an inclusive system, Algorand took its green commitment further with a pledge, on Earth Day 2021, to be a carbon-negative network now and into the future.

To offset the minimal carbon footprint the network generates, Algorand turned to a blockchain-based solution. Through a first-of-its-kind partnership with ClimateTrade, a leader in CO2 emissions transparency and traceability for corporations around the globe, Algorand's network is offset through the on-chain purchasing of carbon offset credits.

While sustainability is critical for the world, it has also proven critical in the industry's efforts toward adoption. If consumers and corporations have available to them only a blockchain that is environmentally detrimental, whether in financial services, the arts, or government projects, shifting to blockchain-based systems is unrealistic. Throughout the year, Algorand-based ecosystems for DeFi, creators, gaming, and beyond have all seen massive growth, with founders consistently citing

Algorand's sustainability as a pivotal factor in their decision to build on the protocol.

Algorand technology has also attracted innovators looking to leverage blockchain to develop broader climate solutions. For example, Global Carbon Holding uses Algorand to tokenize carbon credit assets in Asia, supporting a global marketplace where users can buy certified offsets. And PlanetWatch, an Algorand-based platform for air quality sensors, recently announced a new partnership with the City of Miami to implement its sensors – part of Mayor Francis Suarez's "Miami Forever Climate Ready" Initiative.

Algorand's technology is designed to scale, to be secure, and to be fast. It solves the blockchain trilemma and is consistently processing hundreds of thousands of transactions per day, attracting pioneering artists, and being leveraged by top financial institutions. None of this can come at the expense of being responsible and accountable to the environment.

As founder Silvio Micali said at Decipher, the Algorand community's first annual global conference, "a blockchain that is bad for the environment is a bad blockchain."



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## BUILDING BETTER AGRICULTURE THROUGH TRACEABILITY



Agriculture (Ag) producers face looming requirements from governments and corporations to track all food throughout the entire supply chain, especially livestock. Such regulations represent a significant burden to producers, whose margins have been shrinking for decades.

The First National Bank of Omaha (FNBO), the fourth largest Ag bank in the US, saw the power of blockchain technology to affordably solve this problem for Ag producers.

Working with a consortium of Ag, finance, and blockchain partners, FNBO created Cattle ID. Cattle ID will use machine learning to identify individual cattle to create unique digital identities. Using these identities, Ag producers can add health and treatment records to each animal, privately by default, but easily shareable by producers on the Cattle ID blockchain.

Because Cattle ID uses machine learning, animals can be uniquely identified for the cost of taking a digital photo or video - nearly nothing after the purchase of a smartphone or camera. Most other attempts to solve the traceability problem in livestock have relied on expensive RFID tags or DNA tests to create and prove identities.

With cattle in particular, the nature of the supply chain is also a barrier to traceability. Unlike chicken, in which processors or retailers control production from birth to point of consumption, cattle producers are

largely independent. They have actively resisted the “chickenization” of their industry. Producers recognize their need for traceability and how they would benefit from sharing some information, but they want to stay in control of their data.

Blockchain technology is ideal for Ag traceability for three reasons:

- Data capture
- Control of access
- Ease of shareability

When a digital ID is created for an animal, data can easily be appended to that ID on a blockchain.

Ag producers, many of whom have honed their operations over generations, have valuable proprietary information that they are not eager to share freely. They value not only the ability to collect data on a blockchain but also to protect it, having the choice when and how to share it.

Producers also see the value of sharing data. When they receive information about animals, both before purchase and after selling them, they can optimize their operations for greater efficiency and sustainability. Having a standard way of sending and receiving data benefits producers and consumers.

Cattle ID employs blockchain technology to solve Agriculture’s traceability problem and to help Ag producers stay independent and profitable.

## CHIA FORGES TECHNOLOGY PARTNERSHIPS WITH COSTA RICA AND THE WORLD BANK



The government of Costa Rica, a driving force behind the Paris Agreement and the first country to commit to climate neutrality, has identified blockchain as a tool to facilitate climate action and achievement. Chia's open-source blockchain technology has the potential to improve transparency and reduce inefficiencies in climate markets and UNFCCC reporting, helping nations collaboratively achieve the Paris Agreement goals.

Chia is working with Costa Rica to upgrade their development of an open-source software platform, which will be shared freely with other nations to improve the management of their climate inventory. It will also be used to operate national registries to manage carbon inventory, climate registry, and record bilateral corresponding

adjustments with trades occurring to move credits among countries.

Chia is committed to being the digital rails for enabling climate inventory management. In addition to the partnership with the Government of Costa Rica, Chia is partnering with the World Bank to build the next and most functional prototype of the Climate Warehouse. The Climate Warehouse was convened by the World Bank and will be launched under international governance as the underlying data architecture that connects all national parties, market participants, and service providers to collaborate on climate action to achieve national and entity level climate commitments and the shared goals of the Paris Agreement.

A photograph of a waterfall cascading down a rocky ledge into a pool of water, surrounded by dense green foliage.

**“The Government of Costa Rica selected Chia as an open-source partner due to both its technical software and open-source expertise, but also the platform’s commitment to secure, sustainable, inclusive blockchain technology and immutable data storage,”**

Andrea Meza Murillo, Minister of Environment and Energy of Costa Rica.

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## A BLOCKCHAIN PLATFORM TO BRING TRANSPARENCY TO OUR SUPPLY CHAINS



The last year revealed our collective vulnerability to disruptions in our supply chains. Whether pandemic-induced supply and demand imbalances, or unexpected freezes, fires, or floods, a single event in one part of the world can create economic shockwaves globally.

Companies, governments, and investors are reassessing where and how we manufacture our goods, and cost is no longer the single criteria. Instead, business leaders are asking themselves how they can deliver products to the market that are responsibly and sustainably sourced and backed by resilient and secure supply chains—they're seeking an ever-present view into their production to ensure that the promises they make to customers, investors, and society are backed by proof.

Circular provides in-depth, real-time tracking and tracing of complex industrial supply chains with the most mature, proven, and complete solution for high-risk and high-human impact materials. Circular's technology assigns a digital identity to a commodity at its point of extraction and tracks the supply chain data at each stage of production to provide an immutable record of provenance, activity, compliance, and potential anomalies.

Coupled with the real-time commodity tracking, Circular assigns direct, indirect, and attributable GHG emissions. By enabling proof of GHG and ESG impact based on the actual flow of materials, it provides a richer view of the CO2 attribution from each supply chain participant. Taken together, Circular

customers see the flow of materials in their supply chain, potential anomalies, progress toward their GHG and ESG emission goals, and they gain full intelligence to make decisions and ensure responsible and sustainable sourcing.

Forward-thinking businesses are setting entirely new standards using Circular's technology.

With Circular, Polestar is spearheading a movement of transparency and greenhouse gas reductions throughout the automotive industry and building the first climate-neutral car by 2030.

Britishvolt, a lithium-ion battery producer based in the UK, is working with Circular to ensure its Gigaplant serves communities and the climate, as well as the electric vehicle battery market. The two companies will track and trace the minerals and materials of all the batteries that the facility produces. It will also track the corresponding GHG emissions across Scope 1, Scope 2, and Scope 3. Going further, Britishvolt will track all the materials and corresponding emissions during the construction of the Northumberland Gigaplant facility itself, as well as the local economic development that grows as a result.

As companies put into action their plans to be engines of positive change for society, responsible stewards of the environment, and resilient and reliable contributors to our economic growth, Circular's technology gives them the full visibility of their options and a competitive advantage for leading into the future.

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## **T77 PROJECT:** THAILAND'S BID TO LEAD THE WORLD IN A DISTRIBUTED GRID



It's perhaps not surprising that Thailand's government is putting its weight behind some innovative climate change projects. Thailand is one of the ten most flood-threatened countries in the world with its extensive, low-lying coast, and river vulnerabilities. The government is setting a renewable energy target of 30% by 2036.

In October 2018 the Thai government set up the T77 project and asked Powerledger to help them deploy a peer-to-peer (P2P) platform at a number of sites around the country. The aim was to provide important insights into the best pathways to support the mass adoption of P2P renewable energy trading across the nation.

P2P sharing is vital because countries with high levels of solar energy struggle to maintain grid stability. It is becoming clear that without P2P sharing these problems only get worse; the solution is energy sharing in the form Powerledger is trialing.

The trial is centered on the T77 Precinct, located in the heart of Bangkok. This P2P energy trading project marked the first time renewable energy was ever traded "across the grid" in the ASEAN region, and it is being sponsored by BCPG.

The project sets up a P2P trading link between several large energy consumers in the precinct, including Habito Shopping Mall, Bangkok International Preparatory & Secondary School, Park Court Serviced Apartments, and Dental Hospital Bangkok. Any solar energy

generated by each of the participants is consumed within the building first, and then any excess is sold to the other participants using Powerledger's blockchain-enabled trading platform. This replaces an earlier system where excess was returned to the grid with zero payment. The Metropolitan Electricity Authority (MEA) has provided access to its electricity network for this.

In 2021, the T77 project was expanded to provide for two multi-tenanted residential complexes and a smart office building. This increases the average megawatt hours of energy generated and brings a total of seven multi-tenanted buildings and six solar arrays trading through the innovative energy scheme, with a total of 1.2MW now connected to the project. Powerledger and BCPG are hoping to provide the world with a best practice example of how to optimize distributed energy resources to accelerate change.

Perhaps the most exciting part of this is that it will help defer the need for billions of dollars of grid reinforcement that usually becomes necessary as more solar appears on the grid. This deferred investment in grid infrastructure can have a major effect on the cost of electricity delivery, with significant savings achieved.

For more details on the T77 Project watch the video at: [https://www.youtube.com/watch?v=X-k44NQdmG8&ab\\_channel=Powerledger](https://www.youtube.com/watch?v=X-k44NQdmG8&ab_channel=Powerledger)



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## COLLABORATING ON 21ST CENTURY SOLUTIONS

DOVU, partially owned by Jaguar Land Rover, is a tokenized data economy for DeFi carbon offsetting. It enables landowners who've implemented carbon sequestration practices to tokenize their land and makes it easy for businesses and individuals to offset their carbon footprint through its decentralized marketplace.

Today, organizations can issue, buy, and sell "carbon credits" which represent carbon dioxide's removal, capture, or sequestration through long-term projects. Carbon credits are generated when carbon sequestration projects raise funds for operations. Carbon credit purchases represent a carbon offset and enable anyone to become carbon neutral, but there are many challenges.

There's no way to trust whether a forest of carbon-reducing trees has been sold 100 times over - the double-spend problem. It's slow and expensive to fractionalize carbon credit projects or fairly exchange fractionalized credits. And it's difficult for investors to trust the evidence of a project's progress.

Public DLTs have the potential to eliminate these challenges through



tokenization and the hashing of details of a carbon offsetting project. However, most DLTs fail to meet requirements due to lack of scalable performance, prohibitive fees, and/or unstable governance structures.

DOVU chose Hedera for its low, predictable fees, scalable performance, and no-fork network guarantee. DOVU utilizes the Hedera Token Service for low-cost tokenization of carbon-offsetting projects. Tokenizing land, for example, costs \$1 USD, and transfers cost less than \$0.01 USD (vs. tens/hundreds of dollars on other networks). The Hedera Consensus Service is used for publicly verifiable and immutable logging of project maintenance updates, documentation, lab reports, and more.

Landowners, companies, nations, and individuals use DOVU to issue and exchange carbon credits, enabling a more sustainable future for everyone. DOVU ensures greater trust for anyone looking to invest in carbon-offsetting projects, while ensuring fast, fair, and secure issuance and exchange of tokenized carbon credits.

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## RECYCLEGO UPDATE

RecycleGO is a post-consumer and post-industrial data platform supporting efforts toward a circular economy. Utilizing blockchain technology and artificial intelligence, RecycleGO enables tracking, development, optimization, and management of sustainability strategies while lowering operational costs. RecycleGO leverages blockchain and



other technologies to improve the recycling system through increased participation and sustainability throughout a product's life cycle. By tracking activity on a decentralized ledger, RecycleGO establishes transparency and accountability in sustainable supply chains and allows users to track their impact. RecycleGO's

blockchain solution is being deployed to track and optimize plastics recycling and other sustainable supply chains in Sub Saharan Africa, Southeast Asia, and other regions, to derive actionable data for multiple sustainability and NetZero initiatives.

RecycleGO works with companies, governments, nonprofits, and other organizations to address challenges on a worldwide scale.

As the world enters its third year of a global pandemic, RecycleGO continues to make an impact and build on its vision of using blockchain technology to create a more sustainable future. The extended global pandemic has exposed weaknesses in the world's supply chains, and blockchain solutions became increasingly relevant as consumers demanded more information about where and how products were made. The pandemic has

seen increased production of PPEs, usually manufactured with blown-woven plastics, and hence more environmental leakage. COVID-19 has created an increase in our plastics environmental crisis.

RecycleGO used its learnings from the first half of 2021 to retool and redevelop its sustainability focused tracking blockchain. It is working with existing and new partners in Sub Saharan Africa and Southeast Asia to not only track hard to recycle plastics being removed and recycled, but to also provide a framework for Extended Producer Responsibility (EPR) Programs to be accurately deployed and tracked for packaging materials. This year will see the RecycleGO blockchain released into the markets for other types of recyclable materials, including nonferrous metals, ferrous metals, papers, and electronic waste, providing blockchain verification of material provenance.

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## **BUILDING MARKET INFRASTRUCTURE SOLUTIONS FOR AFRICAN GREAT GREEN WALL CARBON CREDITS**



Xange.com has been selected as a key partner of the United Nations to establish, and sustainably operate, a securities exchange out of Mauritius. We are working hand in hand with the UN Development System (UNDS), focusing on African market infrastructure solutions for carbon markets, to contribute to the Sustainable Development Goals.

Key focus points for Xange.com include climate change and climate security, the prevention and mitigation of illicit financial transactions, and carbon emission initiatives. The initiatives use blockchain technology to bring transparency to carbon accounting by avoiding double counting of emission reductions or removals.

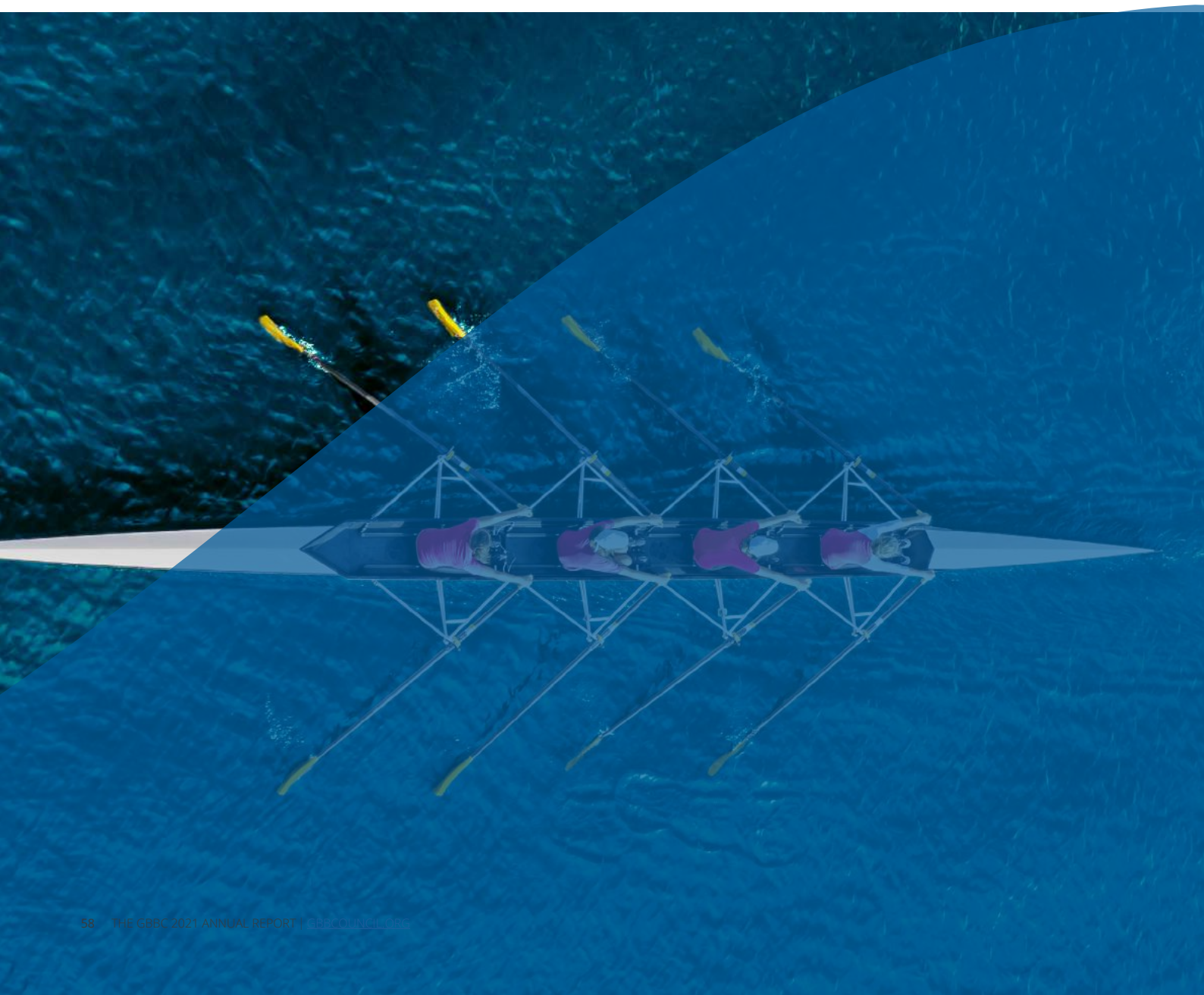
Xange.com is preparing the launch of its voluntary carbon credit infrastructure out of Mauritius to channel Carbon Credit Offsets from the African Great Green Wall Initiative.

Xange.com will develop a Carbon Credit Solution on the XRP Ledger for the issuance of tokenized carbon credits, in accordance with standards set by the leading industry working groups like the InterWork Alliance (IWA), a Global Blockchain Business Council (GBBC) initiative, and the Taskforce on Scaling Voluntary Carbon Markets (TSVCM), of which Xange.com is a member.

Xange.com will aim to co-create a Great Green Wall Fintech ecosystem that supports innovation around digital technologies that will benefit the

private sector, fostering growth and innovation, while also improving upon the inefficiencies surrounding current governments, funding, and banking initiatives.

The work of the United Nations and Xange.com is to ensure that the highest levels of scalability can be achieved throughout the wider UN programmes and conventions by delivering a governance and technology framework that mitigates risks and enhances deliverables.





# ACKNOWLEDGMENTS



The Global Blockchain Business Council is grateful for the extraordinary people who have contributed to the creation of this report.

We extend special thanks to: Sandra Ro, Mercina Tillemann, Paul Rapino, Sierra Lewis, Riyadh Carey, Sofia Arend, Jackson Ross, and Brandon Pelar.

Thank you for joining us as we continue to carry out our mission in 2022 to further adoption of blockchain technology by engaging and educating regulators, business leaders, and lawmakers on the benefits and applications of this groundbreaking technology.

**THANK YOU TO OUR MEMBERS WHO CONTRIBUTED:**

7CC	J.P. Morgan
Accenture	Kaiko
Algorand	Latham & Watkins
Atomyze	LiquidX
Aventus Network	Merkle Science
A100x	Nasdaq
Bitt	Orbs
Blockchain Triangle	PoA Studios
Boson Protocol	Powerledger
Blockchain Technology Partners (BTP)	RecycleGo
Calastone	Red Date Technology
Chia Net	SBI Digital Asset Holdings
Circular	Stellar Development Foundation
ConsenSys	SIX Digital Exchange
Digital Asset	Sensorium Corporation
Evertas	Soramitsu
Ernst & Young - EY	State Street
Filecoin Foundation	Sygnum Bank
First National Bank of Omaha (FNBO)	Tokens.com
Genesis	Valid Network, Ltd.
Hedera Hashgraph, LLC	VMware
Hut 8 Mining	Xange.com
ioBuilders	

