UNLOCKING THE POTENTIAL
OF REGULATED DIGITAL ASSETS

FUTURE MATTERS

BNP PARIBAS

The bank
for a changing
world

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FOREWORD

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AS the financial services industry continues its digital transformation, custodians have a significant role to play in ensuring the safety and security of all client assets, digital or otherwise.

The regulatory landscape within the digital assets space is fast-changing and authorities are placing great emphasis on a cautious, measured, and informed approach to digital asset service provision. With this in mind, BNP Paribas is closely following regulatory developments as they evolve. We are adopting an incremental approach to building the strong foundations required to support our clients on their digital asset journey.

This paper highlights some of the work we have done to learn and grow within the tokenised asset space, in particular via a series of experiments with our clients and trusted partners. It also provides an overview of the current regulatory landscape in key markets across the globe with a view to helping our clients navigate the various requirements in each jurisdiction.

A common global taxonomy may currently be lacking for these assets, but it is our duty to engage with authorities and help to build sensible and proportionate digital asset regulation for the future of the industry. Likewise, exploring the potential of blockchain to transform key processes within the industry enables us to adapt our own services as necessary to allow clients to truly benefit from these developments.

THIS PAPER HIGHLIGHTS SOME OF THE WORK WE HAVE DONE TO LEARN AND GROW WITHIN THE TOKENISED ASSET SPACE, IN PARTICULAR VIA A SERIES OF EXPERIMENTS WITH OUR CLIENTS AND TRUSTED PARTNERS. IT ALSO PROVIDES AN OVERVIEW OF THE CURRENT REGULATORY LANDSCAPE IN KEY MARKETS ACROSS THE GLOBE.

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1 DIGITAL ASSETS: GLOBAL REGULATORY OUTLOOK

A GLOBALLY focused and comprehensive regulatory framework for digital assets would serve to protect investors and help to define services for market participants, while also fostering innovation in the digital asset space. However, the current reality the industry is faced with is a patchwork of in-flight regulatory initiatives across the major global markets that sometimes conflict in key areas, particularly in the definition of various digital assets.

There has been some progress at the global level in terms of drafting guidelines, with bodies such as the International Organization of Securities Commissions (IOSCO) proposing baseline recommendations for global regulators. Yet, these remain guidelines rather than binding global frameworks. The various approaches adopted by each market do not currently seem to be fully consistent.

For instance, when it comes to establishing a wholesale central bank digital currency (CBDC) to support the payment leg of digital asset transactions, challenges will arise at the domestic and regional level. The question of the recognition and adoption of domestic and regional CBDCs at an international level will also need to be addressed.

Authorities, regulators, and market participants are on a journey to learn more about the nuances of digital assets, especially when it comes to tokenisation and the responsibilities of various actors in the digital chain. This means that regulatory frameworks are likely to change and adapt during industry experimentation. This is reflected in the decision by some authorities and legislators to adopt a sandbox approach to market engagement. Moreover, as digital assets exist and reside on-chain, the spectre of cybercrime looms large for the sector, which will necessitate extra monitoring and oversight from a regulatory perspective.

Digital assets must also exist alongside the traditional finance world, with some tokenised assets represented off-chain as well as on-chain. These touchpoints will also present their own regulatory challenges as existing regimes must be adapted to consider digitalisation. In much the same way as planes and boats coexist as different modes of transportation, digital and traditional financial instruments will coexist as different investment options. A lack of interoperability and cross-border requirements pose challenges for traditional assets. Similarly, digital assets must also navigate these complexities in a maturing market.

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AUTHORITIES, REGULATORS, AND MARKET PARTICIPANTS ARE ON A JOURNEY TO LEARN MORE ABOUT THE NUANCES OF DIGITAL ASSETS, ESPECIALLY WHEN IT COMES TO TOKENISATION AND THE RESPONSIBILITIES OF VARIOUS ACTORS IN THE DIGITAL CHAIN.

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EUROPEAN UNION

The Markets in Crypto-Assets Regulation (MiCA, MiCAR) is the first regional-level regulation within the global digital assets landscape to cover the issuance and provision of services for crypto-assets. It is expected to enter into full application from the beginning of 2025. The Level 1 text of the implementing regulation was published in the Official Journal of the European Union on 9 June 2023. The European supervisory authorities are currently drafting the regulatory technical standards (RTS). The RTS will clarify the implementation process and technical elements at a granular level, including, without limitation, specific disclosure obligations, the authorisation processes for crypto-asset service providers and internal governance standards.

BNP Paribas and other industry participants have a significant role to play in participating in consultations with the European supervisory authorities to provide valuable practical feedback and positions, with a view to promoting proportionate standards.

Once MiCA is fully applicable, certain existing national regimes will be superseded and replaced by the MiCA regime, provided that the scope is the same with regard to the types of crypto-assets.

The crypto-asset regime under MiCA covers the issuance and the provision of services for utility tokens, e-money tokens and asset reference tokens but does not cover non-fungible tokens, decentralised finance (DeFi) or financial instruments covered by existing EU regulations such as the Markets in Financial Instruments Directive (MiFID).

MiCA is part of the EU's wider digital finance package, the purpose of which is to foster innovation and fair competition in the region. It also aims to ensure financial stability in the distributed ledger technology (DLT) and digital asset space.

The European Commission legislative package also includes the DLT Pilot Regime, which entered into application in March 2023 and created a sandbox for market infrastructures in the EU to test distributed ledger technology while being exempted from some regulatory requirements under CSDR (Central Securities Depositories Regulation) or MiFID/MiFIR. The DLT Pilot Regime is initially due to run for three years and may be extended a further three years. The programme is designed to allow market infrastructures to apply DLT to trading and settlement operations at an EU level. This approach is also the first at a regional level, which is important to pave the way to create a welcoming framework to promote innovation within financial markets.

The success of the DLT Pilot Regime has strong dependencies. Interoperability of EU DLT platforms will be of utmost importance in the coming years to foster the creation of a level playing field, common standards, and accessibility across markets. It is worth highlighting that the notion of "financial instruments" has been adjusted by virtue of Article 18 of the DLT Pilot Regime to capture instruments issued by means of distributed ledger technology. Security tokens therefore fall into the scope of financial instruments under MiFID.

Ensuring that the settlement part of the transactions can also be made on-chain (notably by using central bank digital currencies) is also one of the milestones of a successful experience for participants.

Custodians will play a key role in driving the agenda forward from a market practices standpoint. This role will entail numerous challenges as the industry transforms and the applicable regimes adapt over time, especially as the technology and asset classes evolve.

The EU's digital finance package establishes a sound legal framework for digital assets that will protect investors and ensure market integrity in a manner proportionate to the type of assets in this area. It also strengthens the operational resilience of a sector that is especially sensitive to cybersecurity breaches, IT, and cyber risks via the Digital Operational Resilience Act (DORA). However, the various components of the package will be dependent on technical elements that are yet to be drafted.

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FRANCE

French authorities were among the first European authorities to introduce specific digital asset legislation due to the national focus on growing the financial technology start-up (fintech) sector in 2016 with the PACTE law. The Autorité des Marchés Financiers (AMF) and the French Treasury drafted a framework to support DLT-based recording of unlisted securities, which later expanded to encompass other types of digital assets.

The later focus of the regulators was on regulating the primary markets and the issuance of crypto-assets, as well as the authorisation of digital asset service providers. **The focus of these efforts is the prevention of market abuse and investor protection, while allowing the trading and settlement of non-listed financial instruments on DLT platforms.**

The French regulators introduced a distinction between different types of crypto-assets, segmenting digital assets such as utility tokens and crypto-currencies from security tokens. The authorisation programmes allow for issuers and registered digital asset service providers to engage in initial coin offerings (ICOs) and to provide crypto-asset services. The regime provides specific labels for each type of in-scope asset and requires the publication of a whitepaper as part of the authorisation process. There is a lighter touch approach for asset managers, asset owners, banks and brokers that are already registered with the AMF to offer services in this area but once MiCA enters into force, a specific, strengthened, and mandatory authorisation regime will come into effect for all market participants.

MICA AND THE DLT PILOT REGIME ARE TWO OF THE WORKS IN PROGRESS FOR THE FRENCH REGULATORS.

The Banque de France has also been one of the most active European central banks on the central bank digital currency experimentation front and has led industry-wide efforts with banks and market infrastructures to this end. The goal of the central bank is to explore the potential of a wholesale CBDC to settle digital asset transactions in central bank money and to enhance cross-border and cross-currency settlements. Banque de France has designed and built its own proprietary DLT platform, DL3S, on which to conduct its CBDC experiments and has been working with both domestic and foreign institutions to begin to craft a viable prototype CBDC.

Both the AMF and the prudential authority (ACPR) have created new teams dedicated to engaging with fintech firms. There have been few significant enforcement actions in the country thus far. From a DLT standpoint, there is a lot of interest domestically in the potential of the technology, as exemplified by the fact that DLT registered nominative bonds can already be issued under French law[1]. The regulators themselves have been upskilling their teams to better understand the technology. The AMF has indicated the need for the right technical expertise to better police these markets[2].

MiCA and the DLT Pilot Regime are two of the priorities and works in progress for the French authorities over the next months as national laws are changed to incorporate their requirements. There are several items outside of both EU-level regulations that will need to be addressed and the ACPR is examining the introduction of a framework for decentralised finance and published a paper on the topic earlier in 2023[3].

1 https://www.amf-france.org/en/news-publications/news/market-infrastructures-blockchain-application-eu-dlt-pilot-regime-march-23rd
2 https://www.amf-france.org/en/news-publications/public-statements/speech-robert-ophele-amf-chairman-banque-de-franceuniversity-orleans-conference-crypto-assets-and
3 https://acpr.banque-france.fr/en/intervention/moving-beyond-first-generation-innovation-and-regulation-tokenized-finance-case-defi-0

SUMMARY The Electronic Securities Act (in force since June 2021) introduced a new means of issuance using DLT. New financial services, namely crypto-custody and crypto-securities registrar services, are overseen by the German supervisor, BaFin. The German regulatory regime is broader in scope than MiCA. Asset managers are getting ready to invest in digital assets, while banks are starting to implement custody solutions.

GERMANY

The German regulatory regime for crypto-assets is broader in scope than MiCA and includes specific securities tokens as well as cryptocurrencies and utility tokens. The German legislator introduced its Electronic Securities Act in 2021 to regulate the issuance of bearer bonds on a DLT-based platform. This was extended to fund shares in 2022 and it will soon be extended to the equities market.

BaFin has been directly regulating crypto-custodians since 2020 and crypto-securities registrar services providers, who maintain the registry of tokenised securities or fund shareholders, since 2021. These firms must have German entities and must register directly with BaFin, which means the market is a little more closed than other European markets and comparatively fewer firms have registered to operate in the jurisdiction.

Issuance of and investment in German digital securities by corporate clients have been cautious and relatively slow thus far, though asset managers are increasingly engaging in proof of concepts around tokenisation because of the 2022 extension of the Electronic Securities Act to fund shares. Asset servicers are also exploring how to manage the private keys to access digital securities on behalf of investors under the existing regulatory framework and how to integrate that process into legacy custody platforms. From a market infrastructure standpoint, the German CSD is currently building a platform to enable the issuance, trading, and settlement of digital securities. Thus far, two German fintech firms have also applied for licenses under the DLT Pilot Regime.

THE GERMAN CSD IS CURRENTLY BUILDING A PLATFORM TO ENABLE THE ISSUANCE, TRADING, AND SETTLEMENT OF DIGITAL SECURITIES.

In recent years, the German Bundesbank has explored the potential of a wholesale CBDC through a trigger solution[4]. Private, cooperative and savings banks in the country have begun to examine the potential of a commercial bank digital currency, but this is at an early stage of discussion. However, the recent ECB project around interbank wholesale CBDC settlement may trigger more activity in the country over the coming years.

Given the differences between MiCA and, on the other hand, MiFID II and the existing German digital asset legislation, the transposition process may be challenging over the next 12 months, especially when it comes to the passporting of EU-harmonised services from other EU countries. The definition of digital assets could also prove tricky as the distinction between crypto-assets and DLT financial instruments is unclear under German law. The German legislator is also working on a new law – the Future Financing Act – to extend the scope of the Electronic Securities Act to the issuance of equities.

4 A trigger solution is a technological bridge or interface between a conventional payment system and a DLT-based application.

SUMMARY The regulator in Luxembourg applies a principle of technology neutrality. It considers that technology has the potential to improve the provision of financial services and believes in a proactive flexible regulatory approach, remaining prudent and risk-based to guarantee consumer protection, market confidence and anti-money laundering (AML) rules.

LUXEMBOURG

In the Luxembourg regulatory framework, there is a distinction between digital assets qualifying as financial instruments and virtual assets, meaning a digital representation of value, including a virtual currency. Luxembourg's regulator – the Commission de Surveillance du Secteur Financier (CSSF) – follows a technology-neutral approach. The regulator's intent has been to support market innovation, while retaining trust and stability in the financial services sector and upholding its investor protection mandate. To this end, the CSSF has issued various guidelines on virtual assets. The legislator has integrated provisions into existing AML law and amended existing financial law to integrate digital assets qualifying as financial instruments.

The legislator voted a law in 2019 recognising the possibility to hold securities on distributed ledger, the so-called Blockchain Law I, and again in 2021 to enable the issuance of dematerialised securities and issuance on DLT-based platforms, Blockchain Law II. These laws allow the use of DLT to hold and transfer securities, as well as the possibility for issuers to use DLT for the issuing and conversion of dematerialised securities. The EU DLT Pilot Regime was adopted in Luxembourg as part of a Blockchain Law III in March 2023, which also clarified the use of the financial instruments issued and represented on a DLT platform for collateral purposes. The aim was to reduce legal uncertainty regarding the use of DLT for financial instruments represented in a digital form (tokenised securities).

Meanwhile, virtual asset service providers acting as administrators, brokers and custodians of virtual assets must apply for a license to provide these services in Luxembourg as part of the requirements under the AML Law. The CSSF assesses each applicant based on the standards of professionalism and risk management framework of the entities involved, including the level of due diligence, and proposed operational framework. More than 10 such entities have been registered thus far.

On the investment side, the CSSF specified that only alternative investment funds reserved to professional investors can invest in virtual assets. To do so, the CSSF requires alternative investment fund managers to notify the regulator beforehand of their plans to invest in virtual assets and these entities must have the relevant license under the Alternative Investment Fund Managers Directive (AIFMD) regime. Investment fund managers are assessed on their financial and operational risk management framework, due diligence process on their service providers and their experience in the asset class, among other criteria. The regulator has also issued several frequently asked questions (FAQs) documents to help market participants (virtual asset service providers, investment fund managers, and credit institutions) to navigate the virtual asset investment process and the various risks.

The national market appetite for digital assets is primarily focused on the tokenised funds universe, reflecting Luxembourg's position as a major European fund hub. Asset managers and service providers are interested in the potential for DLT to foster change in the fund distribution chain. However, implementing the technology requires important investment not only in the infrastructure, but also to come to grips with the particular and specific risks in managing digital assets (e.g., new cybersecurity risks, operational processes, and risks in managing private keys). From a market infrastructure standpoint, the exchange of digital assets through DLT requires digital currencies to allow a fully digitalised settlement cycle. In this respect, the market is following central bank discussions and explorations on a wholesale central bank digital currency.

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UNITED KINGDOM

The UK's regulatory regime for crypto and digital assets has primarily focused on anti-money laundering (AML) and counter terrorist financing (CTF) thus far, but the UK government has introduced a new Financial Services and Markets Act 2023 (FSMA 2023) that formally extends the scope of regulation to digital assets. As part of this new regulation, the UK Treasury has been granted the power to establish individual sandboxes and temporarily modify certain legislation to allow financial market infrastructures (FMIs) and other approved applicants to test DLT-based solutions within those sandboxes.

On 11 July 2023, HM Treasury released a consultation paper regarding a Digital Securities Sandbox (DSS), stating that it will be "the first financial market infrastructure sandbox delivered under the powers granted as part of FSMA 2023." The consultation, which closed on 22 August 2023, aims to confirm the approach taken to the DSS's structure and oversight to allow interested parties to trial financial market infrastructures and the use of technologies under a "temporarily modified legislative and regulatory framework." It asks for feedback on the framework proposal and expressions of interest to utilise the DSS, should it be setup.

The Financial Conduct Authority (FCA) also launched a separate permanent Digital Sandbox[5] in July 2023 with a view to allowing firms and the FCA to learn from the various experiments within a delineated time horizon. The regulator could then potentially adopt these lessons as part of its new regulatory framework for digital assets.

FSMA 2023 sits alongside the UK Treasury's Edinburgh Reforms, which also include proposals for crypto-asset integration and were announced in December 2022 as part of a wider plan to improve the competitiveness of UK financial services. It regulates the use of stablecoins by amending existing e-money and payments legislation. The definition of crypto-assets will be broadened from the current scope of three categories: e-money tokens, security tokens, and unregulated tokens, which include utility tokens and exchange tokens. FSMA 2023 introduced the concept of a digital settlement asset, which includes stablecoins and other crypto-assets that meet the definition, but is not limited to cryptographically secured assets.

THE UK GOVERNMENT HAS INTRODUCED A NEW FINANCIAL SERVICES AND MARKETS ACT 2023 THAT FORMALLY EXTENDS THE SCOPE OF REGULATION TO DIGITAL ASSETS.

5 https://www.fca.org.uk/news/news-stories/launch-permanent-digital-sandbox

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The UK Treasury also published a consultation in February 2023 that builds on existing government proposals to regulate stablecoins in an equivalent manner to the approach to traditional assets on a "same risk, same regulatory outcome" basis. The February proposals are much broader in scope than MiCA in the EU as they include a much wider range of crypto-assets, including nonfungible tokens (NFTs), and the focus is much more on the regulation of activities, such as crypto-asset custody activities, rather than the assets themselves.

The Edinburgh Reforms include the subject of a CBDC, and the Bank of England has launched a consultation on the introduction of a "digital pound" in the retail CBDC context. It is anticipated that these government proposals will take between four and five years to be fully implemented. Much more detail is expected as the FCA puts together the specific requirements over the next couple of years. The final regulations will be guided by the outcomes of the multiple consultations by the UK Treasury and the consultations that will likely be launched by the FCA in the coming months. Currently, there are numerous questions that need to be answered by the regulators such as how each type of digital asset will be classified and treated, as well as formal guidance on the safeguarding of these assets.

There is still some uncertainty regarding whether security tokens are financial instruments under MiFID II, although the FCA has said that such tokens can be considered transferable securities under MiFID as well as specified investments under the UK Regulated Activities Order. Determining this will be a key step in enabling UK market participants such as custodians and depositaries to understand the risks associated with these assets being classified as financial instruments and subject to strict restitution and compensation requirements. It will also allow them to make appropriate plans to mitigate these risks.

THE UK TREASURY PUBLISHED A CONSULTATION IN FEBRUARY 2023 THAT BUILDS ON EXISTING GOVERNMENT PROPOSALS TO REGULATE STABLECOINS IN AN EQUIVALENT MANNER TO THE APPROACH TO TRADITIONAL ASSETS ON A "SAME RISK, SAME REGULATORY OUTCOME" BASIS.

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SWITZERLAND

The Swiss Financial Market Supervisory Authority (FINMA) adopted a technology neutral approach, focused on regulating activities rather than the types of entities performing those activities.

According to FINMA, the deciding factor on whether regulation applies is usually the type of digital asset concerned. FINMA distinguishes between the following categories: (i) payment (digital payment for acquiring goods or services, crypto-currencies), (ii) utility (providing digital access to an application or service through a blockchain-based infrastructure), and (iii) asset token (debt or equity claim on the issuer (security token)).

One of the regulator's core goals is to maintain the attractiveness of the country as a fintech innovation centre, while maintaining investor protection and meeting its existing regulatory requirements such as those under its data protection legislation. Switzerland is home to the first licensed digital asset bank, Sygnum, which launched in August 2019 and FINMA approved the country's first crypto fund, the Crypto Market Index Fund, in September 2021.

The regulator's first digital asset rules were issued in the form of stablecoin guidelines in 2019, which were later followed by formal legislation. The first regulatory requirements to come into force for digital assets related to AML, KYC and CFT[6] provisions under the AML Act of January 2019. The second rules came into force in January 2020 under the Travel Rule Requirement, which requires information about clients and beneficiaries to be transmitted with payment orders related to digital assets.

The Swiss DLT Act came into force in August 2021 and introduced a special category of tokenised rights that allow the transfer of digital securities, known as uncertificated register securities or URS (Registerwertrecht), on the blockchain. This altered existing rules that previously required a physical or digital signature for the transference of all securities in the country. FINMA categorises digital assets into three buckets: digital payments, under which crypto-currencies sit, utility tokens, and asset tokens (otherwise known as security tokens).

Digital asset services providers must apply to FINMA for various licenses to operate in the country, depending on the type of transaction involved. A banking license is required for firms holding deposits and for crypto-custodians that only hold or store payment tokens. On the other hand, a fintech license is required for crypto-custodians that offer pooled custody services for digital assets. A DLT trading license is required for crypto exchanges that trade DLT-based securities, utility, and payment tokens.

FINMA ties the approval of digital asset funds to specific requirements related to the risks inherent in these asset types. For instance, funds may only invest in established crypto-assets with a sufficiently large trading volume and these investments must be made through established counterparties and platforms that are based in a member country of the Financial Action Task Force (FATF), which are subject to corresponding AML regulations.

The Swiss National Bank initially stated that it would not work on a central bank digital currency (CBDC) programme. However, the central bank's standpoint has since changed with regard to exploring a wholesale CBDC. To this end, it conducted a cross-border trial for CBDC with the Banque de France in November 2021. The trial involved the exchange of a digital euro with a digital Swiss franc, as well as the issuance, redemption, and transference of tokenised euro-denominated French commercial paper between several financial institutions.

Though most Swiss digital asset regulations have been implemented, new developments such as the OECD's minimum taxation project regarding the digital economy (expected before the end of 2023) may also have an impact. FINMA is also examining the area of sustainability and green financing in the digital assets market with a view to improving transparency and comparability for investors. Green fintech is one of the areas highlighted in the Federal Council's report on the financial sector in 2022, entitled "Digital Finance: Areas of action 2022+[7]", alongside the continuing development of the digital asset and DLT space.

6 Anti-money laundering (AML), Know your client (KYC), Counter terrorist financing (CTF)
7 https://www.sif.admin.ch/sif/en/home/finanzmarktpolitik/digitalisation-financial-sector/digital-finance-areas-action.html

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SUMMARY While Congress continues to consider possible digital asset legislation, the US agencies and regulators have taken a cautious approach. This has been either through requiring bank notification about digital asset activities and limiting connections between banks and certain digital asset risks or bringing legal actions to enforce existing securities and commodities regulations. While legislation is under consideration, the US, like many other jurisdictions, is far from implementing a CBDC.

UNITED STATES

The US approach to the regulation of digital assets has been a function of the fragmented US regulatory structure and the uncertainty with which existing US laws treat these assets. **Congress is considering several bills that would clarify the structure of the digital asset market and create an oversight regime for stablecoins. However, it has yet to reach consensus on either issue. The Biden Administration has recommended that Congress prioritise the regulation of stablecoins and the crypto spot market.**

On the regulatory side, the Federal Reserve Board (FRB), the Office of the Comptroller of the Currency (OCC), and the Federal Deposit Insurance Corporation (collectively, the US banking agencies) have adopted a cautious approach to digital assets and have issued guidance requiring banks to notify them about possible new digital asset services, including custody. The focus of the US banking agencies has been to maintain bank safety and soundness and minimise risks that may arise from bank over-concentration in crypto. These efforts to limit bank risks have also been aided by the US Securities and Exchange Commission's (SEC) March 2022 Staff Accounting Bulletin (SAB) 121 that requires firms to record the custody of digital assets as liabilities and assets on their balance sheets. **Since this accounting treatment would trigger increased prudential requirements for covered banks, SAB 121 has made the cost of digital assets custody prohibitive for most US banks.**

THE FOCUS OF THE US BANKING AGENCIES HAS BEEN TO MAINTAIN BANK SAFETY AND SOUNDNESS AND MINIMISE RISKS THAT MAY ARISE FROM BANK OVER-CONCENTRATION IN CRYPTO.

In addition, both the SEC and the US Commodity Futures Trading Commission (CFTC) have worked to subdue fraud and other illegalities in the digital asset market, especially following the 2022 collapse of the FTX exchange. The SEC has also taken the position that digital asset tokens are covered by existing US securities laws, and that exchanges need to register with the SEC. The SEC has brought legal actions to advance this approach, albeit with mixed results to date.

At the state level, regulators like the New York State Department of Financial Services (NYSDFS) have issued new requirements stating that licenced banking entities should seek the prior approval from NYSDFS before commencing any new digital asset activity.

The United States is also considering a US CBDC. In January 2022, the FRB issued a consultation and solicited public comment about the idea. The FRB has indicated that it will not act without broad political consensus about their authority to issue a CBDC. However, several Federal Reserve Banks have initiated pilot projects to assess the feasibility of a wholesale CBDC, which has been less controversial than a CBDC for the retail space.

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SUMMARY Singapore's regulator has been one of the leaders in the region in proposing a new framework for designing open, interoperable networks for digital assets. Additionally, it has been particularly active in the fintech sector in encouraging the testing of DLT-based platforms. Rather than focusing solely on domestic initiatives, the regulator has engaged in several different international projects with other central banks and foreign regulators.

SINGAPORE

The Monetary Authority of Singapore (MAS) is the securities market and banking regulator in the country, and it categorises digital assets into three main groups: securities tokens, payment tokens and utility tokens. **Securities tokens are currently generally regulated in the same manner as traditional securities and MAS assesses these assets under the "capital markets products" category of the Securities and Futures Act.** Service providers that are determined by MAS to be handling digital assets that fall into this category must therefore hold a capital markets services licence, unless specifically exempted by the regulator. Similarly, payment tokens are regulated under the Payment Services Act 2019 and service providers must obtain a payment licence from MAS to operate in this sector.

The Financial Services and Markets Bill 2022 was passed in April 2022 to enhance the existing national regime for regime for anti-money laundering (AML) and counter terrorist financing (CTF) by extending it to digital token service providers, including digital asset custodians. It introduced formal licensing requirements for service providers and granted MAS with powers to conduct AML and CFT investigations of these providers.

MAS has been particularly active in the fintech sector about directly investing in and encouraging the testing of DLT-based platforms for a variety of different use cases within the financial services sector. One such use case is the development of a retail CBDC, on which MAS produced a report in November 2021 detailing the economic case for such a currency in the domestic market. However, there has been little movement on the topic of a retail CBDC since the production of the report and MAS has instead focused on a project related to the introduction of a wholesale CBDC. Project Ubin+ was launched in November 2022 and is being conducted in cooperation with the Bank for International Settlements.

The regulator has engaged in several different international projects with other central banks and foreign regulators in a similar vein to Project Ubin+. Another example is Project Mariana, which is being conducted alongside the central banks of Switzerland and France to explore DLT-based cross-border foreign exchange transactions and improved global liquidity management. In the tokenisation space, MAS is also working with BIS and eleven different financial institutions to explore the design of interoperable networks for tokenised digital assets, which is called Project Guardian.

THE REGULATOR HAS ENGAGED IN SEVERAL DIFFERENT INTERNATIONAL PROJECTS WITH OTHER CENTRAL BANKS AND FOREIGN REGULATORS.

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HONG KONG

The Hong Kong Securities and Futures Commission (SFC) is the primary regulator for securities in the local market. As such, it oversees tokenised assets and securities-based tokens. It also regulates platforms that trade non-security tokens. SFC regulates these assets and their related activities based on the existing legislative framework, though it has introduced direct regulation related to anti-money laundering (AML) for virtual asset service providers. The requirements for these platforms include offering services to professional investors only, safe custody of client assets, cybersecurity, anti-money laundering obligations, private key management, internal audit, and controls.

Hong Kong has stated its intention to become a global crypto-asset hub and one of SFC's initiatives is to allow retail investors to directly invest in virtual assets. These investors have been permitted to invest in cryptocurrency tokens such as bitcoin and Ether on licensed platforms since June 2023. Amendments were passed to Hong Kong's Anti-Money Laundering and Counter-Terrorist Financing Ordinance to make it mandatory for all centralised virtual asset trading platforms that carry on the business of trading non-security tokens in Hong Kong and/or actively market such services to Hong Kong investors to obtain a licence from the SFC. The regime began in June 2023.

The SFC also issued a circular in October 2022 that highlights the requirements under which it would consider authorising exchange traded funds (ETFs) that obtain exposure to virtual assets[8]. This is primarily through virtual asset futures contracts traded on conventional regulated futures exchanges for public offering in Hong Kong under sections 104 and 105 of the Securities and Futures Ordinance (SFO). The initial assets allowed are bitcoin futures and Ether futures traded on the Chicago Mercantile Exchange.

The Hong Kong Monetary Authority (HKMA) is the banking regulator and cooperates with SFC in issuing guidelines and new rules related to crypto-assets. To this end, HKMA and SFC issued a joint circular in January 2022 that highlights the broad range of asset types in scope of what they call "virtual assets related products," excluding central bank digital currencies. HKMA has also issued its own circular[9] on the topic, recognising the various international regulatory guidelines and developments in other markets and noting the need for extra caution around AML activities. It has adopted a risk-based approach to supervising banks' virtual asset activities and indicated that it expects banks to identify and understand the associated risks before they engage in any of these activities.

HKMA has conducted public consultations about the introduction of a new regulatory regime for payment-related stablecoins and it is anticipated that these new requirements may be introduced in early 2024. The banking regulator is also actively exploring the introduction of a retail CBDC and began a related pilot programme in May 2023, which it calls the e-HKD.

In terms of tokenisation, HKMA and the Bank for International Settlements' Innovation Hub published a statement in November 2021 on the conclusion of their first green finance project known as Project Genesis. The project involved building prototype digital platforms to enable green bond issuance and simulate bond tokenisation.

8 https://apps.sfc.hk/edistributionWeb/gateway/EN/circular/doc?refNo=22EC60
9 https://www.hkma.gov.hk/media/eng/doc/key-information/guidelines-and-circular/2022/20220128e3.pdf

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SUMMARY The Australian Securities and Investments Commission (ASIC) has taken a proactive approach to engaging with the industry on the topic of digital assets. It has also adopted a technology neutral stance but has established a sandbox for experimentation with DLT.

AUSTRALIA

The Australian Securities and Investments Commission (ASIC) has taken a proactive approach to engaging with the industry on the topic of digital assets over the last few years via consultations and industry awareness sessions. However, the incorporation of digital assets into Australia's existing regulatory framework has not yet been completed and each project is currently assessed on a case-by-case basis by ASIC to determine whether the involved asset constitutes a security or a derivative. Digital asset issuers and service providers may also be obliged to register for an Australian Financial Services Licence (AFSL) and comply with the related obligations, depending on the judgement of ASIC.

The industry has engaged with the regulators on the topic of licensing and the Australian Custodial Services Association has established a working group on the topic of digital asset custody. The Australian Treasury published a consultation on the topic of digital asset service provider licensing in March 2022 with a view to establishing a level playing field for existing traditional service providers and new entrants focused on digital assets. The results of the consultation have yet to be drafted into new rules or regulations, but these are eagerly anticipated by the local market and BNP Paribas is keeping a close watch on developments.

ASIC has adopted a technology neutral stance but has established a sandbox for experimentation with DLT in the local market. It expanded the remit of its existing sandbox in September 2020 to cover security token experimentation and renamed it the Enhanced Regulatory Sandbox. The regulator currently has a watching brief to examine the development of DLT within the financial sector, following developments related to the ASX Chess replacement project, due to its scale and impact on the local market.

Regarding a CBDC, the Bank of Australia engaged with a consortium of large banks in the market to conduct a proof of concept to explore the potential and implications of a wholesale CBDC in 2020. Project Atom was completed in 2021 and the results of the project were published for industry review, however, the central bank has indicated that it has no immediate plans to explore a retail CBDC at this time.

THE AUSTRALIAN SECURITIES AND INVESTMENTS COMMISSION (ASIC) HAS TAKEN A PROACTIVE APPROACH TO ENGAGING WITH THE INDUSTRY ON THE TOPIC OF DIGITAL ASSETS.

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DIGITAL ASSETS: LEARNING BY DOING

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AS A GLOBAL CUSTODIAN,

Securities Services at BNP Paribas aims to support its clients should they wish to enter the digital asset space. We are the long-term partner of choice of our clients, and as such, we believe that innovation and protection of our clients' interests should go together.

Fostering real, durable change is a process. That is why we are taking an incremental approach, experimenting with distributed ledger technology and digital asset processes in regulated environments to build a resilient, compliant, and sustainable digital asset space.

As digital asset regulatory frameworks across the globe continue to evolve, market participants need to get to grips with the requirements of new and emerging asset classes. Much like the regulators themselves, market participants from across the value chain must experiment with distributed ledger technology (DLT) and digital asset processes to better understand their operational, legal, and administrative aspects.

AS DIGITAL ASSET REGULATORY FRAMEWORKS ACROSS THE GLOBE CONTINUE TO EVOLVE, MARKET PARTICIPANTS NEED TO GET TO GRIPS WITH THE REQUIREMENTS OF NEW AND EMERGING ASSET CLASSES.

Important lessons can be learned by being hands-on with these new technologies and asset types. From a practical perspective, understanding the information flows, asset safekeeping responsibilities, liabilities and risks is key to better supporting clients in the future. There are many moving parts that are not yet in place to fully operationalise DLT-based settlement such as the lack of a central bank digital currency (CBDC) for the payment side of the transaction, but there is much to learn from experimentation.

It is with this in mind that we, Securities Services at BNP Paribas, have engaged in several digital asset and DLT experiments over the last few years.

Our vision is to develop seamless access for clients to both traditional and digital assets using the same tools, even if the underlying technologies are different. Some common lessons have been learned across all the experiments so far:

IMPORTANT LESSONS CAN BE LEARNED BY BEING HANDS-ON WITH THESE NEW TECHNOLOGIES AND ASSET TYPES. FROM A PRACTICAL PERSPECTIVE, UNDERSTANDING THE INFORMATION FLOWS, ASSET SAFEKEEPING RESPONSIBILITIES, LIABILITIES AND RISKS IS KEY TO BETTER SUPPORTING CLIENTS IN THE FUTURE.

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- **New responsibilities and liabilities need to be carefully assessed:** legal and compliance teams can leverage these experiments to gain expertise about the structure of legal agreements among parties in the blockchain and digital asset space. These teams can also gain expertise on the particularities of tokenised instruments of various kinds and the responsibilities of each link in the tokenised asset creation and distribution process, especially related to asset safekeeping.

- **Agreement negotiation can take longer than for traditional arrangements:** the negotiation of agreements with providers and partners can take a relatively long time, given the nascent nature of these technologies and asset types. Clearly defining the roles and responsibilities of each participant is necessary to ensure that asset safekeeping is practicable.

- **Operations and technology teams learn by being hands-on:** operations teams can learn about the practicalities of tokenisation processes and digital asset safekeeping by directly working with these assets. Understanding the technology component is one aspect, but another is understanding the newly emerging market practices involved in executing particular actions during the lifecycle of a digital asset.

- **Connecting the digital and traditional worlds takes a considerable amount of work:** the digital and traditional asset worlds will likely coexist for an extended period, and this means that custodians must provide a bridge between both worlds. Some assets are digitally native, but others are mirrored in the traditional funds universe and can be converted into and out of their digital formats.

- **There are numerous elements still lacking in the market:** there are several missing components that are necessary to deliver a full end-to-end digital process to support tokenised assets. One of the greatest challenges for firms participating in these experiments is that cash is still managed off-chain. Even if a security can be settled digitally on a blockchain platform, the payment leg must be processed on existing systems using fiat currency.

- **Public and private blockchains represent differing risks and opportunities:** the benefits of using a public or private blockchains for tokenised assets must be considered alongside the risks for each use case. Public blockchain brings with it additional investor reach but these projects require extra assessments related to technical risks, liabilities, and responsibilities in the event of outages, for example. Private blockchains, on the other hand, must be considered in the context of the ongoing challenges of potentially maintaining connectivity to multiple platforms over time, as well as building a large enough network of participants.

- **Interoperability is central to future industry efficiency:** if true efficiency is to be realised at the market level, interoperability between various blockchains is necessary. Currently, these platforms require separate connectivity to be established and different protocols and standards to be supported.

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EACH OF OUR EXPERIMENTS HAS TAUGHT OUR TEAMS IMPORTANT NEW LESSONS ABOUT THE REALM OF DIGITAL ASSETS AND THE LEGAL, OPERATIONAL, TECHNOLOGY AND COMPLIANCE DYNAMICS OF THIS EVOLVING MARKET.

- **Blockchain technology is still evolving:** it is still relatively early days in terms of the maturity of the technology in the context of tokenised assets.

- **Clarity of process is key to successful experimentation:** it is critical for teams to understand what their roles, responsibilities and liabilities are in the tokenised asset support process. This is dependent on each team understanding the underlying processes and the goals of the experiment, which need to be communicated and agreed at the start.

Each of our experiments has taught our teams important new lessons about the realm of digital assets and the legal, operational, technology and compliance dynamics of this evolving market. Of course, more lessons are ahead of us as the regulatory framework in every country across the globe transforms and markets evolve. For now, we hope the following experiments are helpful in highlighting some of the progress thus far.

WAYNE HUGHES
Head of Digital Assets, Securities Services, BNP Paribas

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DIGITAL CASH

One of the major remaining challenges within the sphere of digital assets is the lack of a digital cash equivalent to support the payments aspect of a securities transaction. To address this area we, Securities Services at BNP Paribas, started exploring in 2020 and took an active role in several experiments, notably the call for projects launched by the French central bank. The Banque de France was the first European central bank to engage in wholesale CBDC experiments with the objective of testing as many use cases and different technologies as possible.

One of these experiments, led by Euroclear with a consortium of banks including BNP Paribas, sought to enable the exchange of a CBDC to settle tokenised French treasury bonds (OAT) on a test blockchain. The process was fully "delivery versus payment" (DvP) and each bank had a node on the central bank's permissioned blockchain infrastructure, DL3S. The experiment, in which the Banque de France acted as the issuer and distributor of the CBDC, and Agence France Trésor (the public Debt Management Office of the French government) as the issuer of the tokenised bonds, took around 10 months to complete. The consortium members tested a wide range of scenarios including the normal DvP settlement of instructions, failed settlements due to a lack of CBDC or a lack of securities, unmatched and recycled settlement instructions, as well as liquidity optimisation mechanisms (repo, auto-collateral and collateral pledge in T2S). The banks generated hundreds of instructions over a four-day period, and an interesting next step would be to test the blockchain's ability to scale and perform in a much wider context and under a much higher number of transactions in production.

ONE OF THE MAJOR REMAINING CHALLENGES WITHIN THE SPHERE OF DIGITAL ASSETS IS THE LACK OF A DIGITAL CASH EQUIVALENT TO SUPPORT THE PAYMENTS ASPECT OF A SECURITIES TRANSACTION.

This experiment involved the Hyperledger Fabric protocol underpinning the central bank's infrastructure and IBM worked with the consortium to adapt the DL3S platform. It was early days for the central bank in testing the concept of a CBDC, therefore the CBDC was only available intraday rather than overnight, which is a feature Banque de France could explore in later phases.

One of the key learnings from the experiment was the feasibility of reduced latency of settlement and improved settlement efficiency through enhanced liquidity and collateral management. Settlement was performed instantaneously, and the platform was able to identify from the transactions where there were CBDC shortfalls and calculate available collateral to settle the transactions automatically. It demonstrated that smart contracts can be a powerful tool in the reduction of settlement failures and improved collateral management at industry level. These smart contracts were also tested in the automatic processing of an interest payment corporate action, which required no further intervention from either the issuer or a custodian. Payments were automatically prepared at defined record date based on the holdings in the investors' wallets and automatically settled in CBDC at defined payment date on the blockchain platform.

PRIVACY CAN BE MAINTAINED ON A DISTRIBUTED NETWORK THANKS TO PREDEFINED ROLES AND PERMISSIONS GRANTED TO THE NETWORK PARTICIPANTS.

Data dependencies across the various market participants in the value chain were also reduced as the golden source of information was disseminated in a distributed manner rather than sequentially. **This meant that accurate and reliable information could be accessed and used by the network participants in real time.** Therefore, delays, reconciliation and operational risk were reduced. The security of the data transiting on an open network was also of paramount importance and the experiment highlighted that data confidentiality and privacy could be maintained even on a distributed network thanks to predefined roles and permissions granted to the network participants.

The other experiment we engaged in was a consortium-based project with Liquidshare focused on DvP for listed and unlisted tokenised equities. Liquidshare at the time had an interesting ecosystem of market participants on board, including major custodians and market infrastructures, though the firm has since liquidated. This experiment was slightly more time constrained than the wider CBDC experiment, with a three-month window for testing. It demonstrated the benefits of a shared network and of real-time data dissemination and information access across a wide range of market participants in a settlement chain.

These experiments highlighted the benefits of working with a consortium in a blockchain-based distributed but permissioned environment where greater efficiencies can be realised as part of a wider ecosystem. Confidentiality and privacy of data, as well as the regulatory controls and tasks by the various participants, could be maintained. However, several challenges remain to be addressed for wider adoption and to achieve the full benefits that the technology could bring. These challenges include:

1. **The performance and scalability of the new solutions**
2. **The regulatory framework and the definition of roles and responsibilities within cross jurisdictional worldwide networks**
3. **Interoperability between various protocols requiring standardisation and collaboration across the industry to avoid market fragmentation**

Since these first experiments, we have continued exploring digital cash and are closely collaborating with various central banks in Europe and in other regions to test new cross border and cross currency use cases. We are an active participant of the newly created European Central Bank wholesale CBDC working group.

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DLT AND FUND DISTRIBUTION: TOKENISED SECURITIES EXPERIMENTS

One experiment in Luxembourg tested the efficiency of the fund transfer process on a blockchain using Allfunds Blockchain for an asset manager client. The goal was to ascertain the efficiency improvements that can be made for tokenised shares on a blockchain platform and the potential for streamlined processing of these assets via tokenisation. The fund is registered in Luxembourg.

Acting as the transfer agent and fund dealing services provider we, Securities Services at BNP Paribas, were required to support the interaction between the legacy fund transfer environment and the private blockchain. The blockchain captured and managed the orders and legacy systems were required to support the order screening and settlement processes for the fund. The experiment highlighted the need for further components of the process to be digitised before true process efficiencies can be realised versus the specific part of the value chain that was tested.

In total, the experiment involved around eight months of testing and implementation with a range of functions from across the bank alongside Allfunds Blockchain as its technology partner.

The overall outcome of the experiment confirmed that the blockchain represents a new communications and fund distribution channel. It also modernised the current process by automating the capture and confirmation of stock transfer transactions, which are currently managed via fax. This process required a high number of validations to be done by the IT team to ensure that the blockchain environment was adequately supported. It demonstrated the value that we, Securities Services at BNP Paribas, can bring to our clients as a supporter of both legacy and new technology environments and the evolving market practices around tokenised assets alongside their traditional counterparts.

Another experiment, this time conducted under the French digital asset regulatory framework, involved working with IZNES to support an asset manager's native tokens. We played the role of the data aggregator across both types of shares: traditional and digital. One of the main challenges for the team was managing a hybrid model where an ISIN was available for the existing traditional shares issued in Euroclear and for the digital shares issued via tokens on the private blockchain by IZNES. As the transfer agent, we had to manage orders and positions of digital shares and had to maintain a consolidated view of the total share issuance.

This experiment allowed us to build out the capabilities to provide clients with a consolidated view across legacy and blockchain environments to support cash forecasting and to integrate order flow from the blockchain into its existing model.

ACTING AS THE TRANSFER AGENT AND FUND DEALING SERVICES PROVIDER, WE WERE REQUIRED TO SUPPORT THE INTERACTION BETWEEN THE LEGACY FUND TRANSFER ENVIRONMENT AND THE PRIVATE BLOCKCHAIN.

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EIB BONDS: THE VENUS AND MARS EXPERIMENTS

The European Investment Bank (EIB), which is the lending arm of the European Union, led the Venus experiment with the cooperation of the central banks of Luxembourg and France. The experiment involved the issuance of digitally native euro-denominated bonds on an Ethereum-based private blockchain, operated by Goldman Sachs. To support the payments process, the Banque de France and the Banque Centrale du Luxembourg created CBDC tokens that were converted to and from fiat currency by the central banks with the former on the investor side and the latter on the issuer side. Our role was to support a client investing in the digital bond from a safekeeping perspective and as a depository bank domiciled in France under the Alternative Investment Fund Managers Directive (AIFMD) regime.

The process of providing safekeeping on a non-traditional platform and the requirement to understand legal obligations and market practices under both French and Luxembourgish law were challenging. As the earlier section highlighted, regulatory divergence exists across Europe about how digital assets are treated. Our responsibilities fell under French law and the legal requirements meant that we had to monitor the location of the asset within the wallet operated by a third party. The team had to regularly check that the investor's correct allocation of the bond resided in the wallet after it had been transferred on an ongoing basis. This involved work on the part of the legal, compliance, operations, and technology teams to understand how to monitor a digital asset wallet in a secure and independent manner from both practical and legal perspectives.

The Mars experiment involved the issuance by the EIB of a GBP 50 million denominated digital bond in Luxembourg on a private blockchain, with some anonymised data mirrored on a public blockchain for investors (Ethereum). BNP Paribas, HSBC, and RBC Capital Markets acted as joint lead managers and the bond was held in digital securities accounts on the HSBC Orion platform, which was the central record for the experiment. We, Securities Services at BNP Paribas, acted as the custodian for existing clients wishing to invest in this digital bond and HSBC acted as the subcustodian as well as the private blockchain operator. The aim, much like for the other projects, was to assess the blockchain's capabilities in a post-trade environment and to provide the involved teams with hands-on experience of the technology and new market practices related to digital assets.

NAVIGATING THE LEGAL FRAMEWORK WAS ONE OF THE MOST CRITICAL AND TIME-INTENSIVE ASPECTS OF THE EXPERIMENT AS THE TEAMS HAD TO UNDERSTAND AND DEFINE THE ROLES OF EACH ENTITY INVOLVED IN THE TRANSACTION WITHOUT THE INVOLVEMENT OF A CENTRAL SECURITIES DEPOSITORY.

The legal framework in Luxembourg was amended in January 2021 to allow securities to be held in DLT databases and again in March 2023 to support the DLT Pilot Regime at EU level. Navigating the legal framework was one of the most critical and time-intensive aspects of the experiment as the teams had to understand and define the roles of each entity involved in the transaction without the involvement of a central securities depository. The liability for the safekeeping of the assets is replicated on a similar model as for traditional assets, under a subcustody agreement signed between BNP Paribas and HSBC. With no automation (lack of SWIFT messages at the moment of the issuance), a manual treatment of the transactions and establishing a specific monitoring process for the assets recorded on the blockchain were needed. As SWIFT messages are being implemented with the subcustodian, we expect a similar level of automation to that of traditional assets will be reached in a few months.

Both experiments taught the involved teams a great deal about the safekeeping of assets in a digital environment, where business continuity and cybersecurity are of foremost importance due to the nature of the asset type. These experiments also underlined that the lack of a level playing field for regulation across Europe continues to pose significant challenges from a practical and compliance perspective as custodians must navigate different and sometimes varying responsibilities in a cross-border environment.

Moving to a blockchain environment could bring about a long-term reduction in manual processes and improve market efficiency. From an investor perspective, these platforms could also improve transparency significantly and open the market to other types of tokenised asset. However, there is a long way to go from a blockchain interoperability standpoint and from a technical perspective in supporting a fully digitised process. The introduction of MiCA in the EU will be a step toward greater harmonisation from the regulatory side, but this will only be at the regional level and there will continue to be divergence globally for some time to come.

OUR ROLE WAS TO SUPPORT A CLIENT INVESTING IN THE DIGITAL BOND FROM A SAFEKEEPING PERSPECTIVE AND AS A DEPOSITORY BANK DOMICILED IN FRANCE UNDER THE AIFMD.

ASSESSING THE FULL LIFECYCLE OF AN ESG-FOCUSED TOKENISED BOND

A key focus for many clients is the creation and support of new, innovative assets in the sustainable finance space. To address this critical issue, this experiment combined the solar-based renewable energy refinancing space and digital assets. The financing of small and medium-sized projects within the renewable energy space is currently underserved from an investment vehicle standpoint, which means it is a greenfield space in which to experiment with tokenised assets. The need for greater investor transparency around the ESG impact of these assets makes them good candidates for a blockchain-based solution, as this technology can provide a greater level of data reliability and accessibility for potential investors.

Leveraging the strength of the integrated bank model of BNP Paribas, Securities Services, BNP Paribas Corporate and Institutional Banking's (CIB) Digital unit and BNP Paribas Asset Management worked jointly to support the full end-to-end lifecycle of a renewable energy-focused, digital bond. The experiment was a valuable testing ground for all the key processes related to a digital asset from asset origination through to asset servicing across all of the involved parties. It involved the structuring, tokenisation, and distribution of a bond for refinancing a solar energy project sponsored by EDF through its subsidiary EDF ENR. The experiment was conducted under French law for unlisted securities and BNP Paribas Asset Management acted as the investor.

The asset was structured and tokenised thanks to BNP Paribas CIB's *AssetFoundry* tokenisation platform. The security token was issued on public Ethereum, hence leveraging full transparency of public data, embedded into the token directly from origination. Still, the security tokens' transactions were permissioned, meaning that only whitelisted Qualified Institutional Buyers could acquire them. Utility tokens related to Ethereum were minted with low carbon energy by Exaion, the EDF subsidiary dedicated to blockchain and high-performance computing services. Ethereum has moved from proof of work to proof of stake, thus reducing the carbon footprint of the technology by around 99%.

The *AssetFoundry* platform was created as part of BNP Paribas CIB's support for clients' experiments in the tokenisation space, with a view to enabling firms to get to grips with the unique processes, challenges, and benefits of digital assets. One of the greatest challenges from our side was in understanding and assessing the legal side of the experiment. For example, it took six months in total to draft, review and agree the technical documentation for just one contract, which highlights the complexities that must be navigated in the digitally native asset servicing space.

LEVERAGING THE STRENGTH OF THE INTEGRATED BANK MODEL OF BNP PARIBAS, SECURITIES SERVICES, BNP PARIBAS CIB'S DIGITAL UNIT AND BNP PARIBAS ASSET MANAGEMENT WORKED JOINTLY TO SUPPORT THE FULL END-TO-END LIFECYCLE OF A RENEWABLE ENERGY-FOCUSED, DIGITAL BOND.

The involvement of several parties from across the BNP Paribas Group required a high degree of coordination and synchronisation across multiple teams from each business unit. Numerous manual processes that had to be supported by teams in lieu of fully established digital infrastructure such as a CBDC to support the cash leg of the settlement. The experiment required around 30 people from across operations, legal, risk, compliance and digital development to support the necessary administrative and operational tasks such as token creation, wallet opening, ownership verification, record keeping and calculation of the net asset value of the fund invested in the tokenised bond. In total, around 90 actions had to be executed on time within one day.

Given the constant evolution of technologies and regulations in the digital assets space, and as part of the Business Continuity Plan, it was also key to test reversibility to a traditional format. This brings additional confidence to clients that such a native digital asset can be reversed back into a traditional format if required. To this end, the tokenised bond was seamlessly switched back to a traditional bond within a 48-hour period. Many of these processes were relatively new for the relevant teams and the planning stages of the experiment were by far the most intensive. All of the actions to support the asset had to be understood and properly defined in terms of roles, liabilities, and risks. The technology side of the experiment was arguably one of the simplest aspects versus the navigation of the legal and regulatory frameworks related to digital assets.

One of the outcomes of this particular experiment was that embedding ESG data directly into the token together with the Term Sheet of the bond potentially allows a more efficient communication of this data to investors at a time when ESG data quality is under intense scrutiny. The transparency of data from the issuer to investor is therefore increased, which is also beneficial from a compliance perspective as all data can be traced. From an investor standpoint, the granularity of the asset means it is potentially much easier to bundle into another investment fund vehicle, which means greater market accessibility. The bundling of smaller tokenised project financing assets could increase their primary and secondary market liquidity in the longer term.

Although the cash leg of the transaction had to be conducted without the use of a CBDC, the experiment proved that it is possible to work with digital assets and existing traditional systems. However, one of the outstanding areas for further industry attention is digital identity management as, currently, firms must be authorised to be able to invest in these assets. The development of a digital identity for know your client (KYC) purposes will be essential in the future to enable efficient digital asset investment processes.

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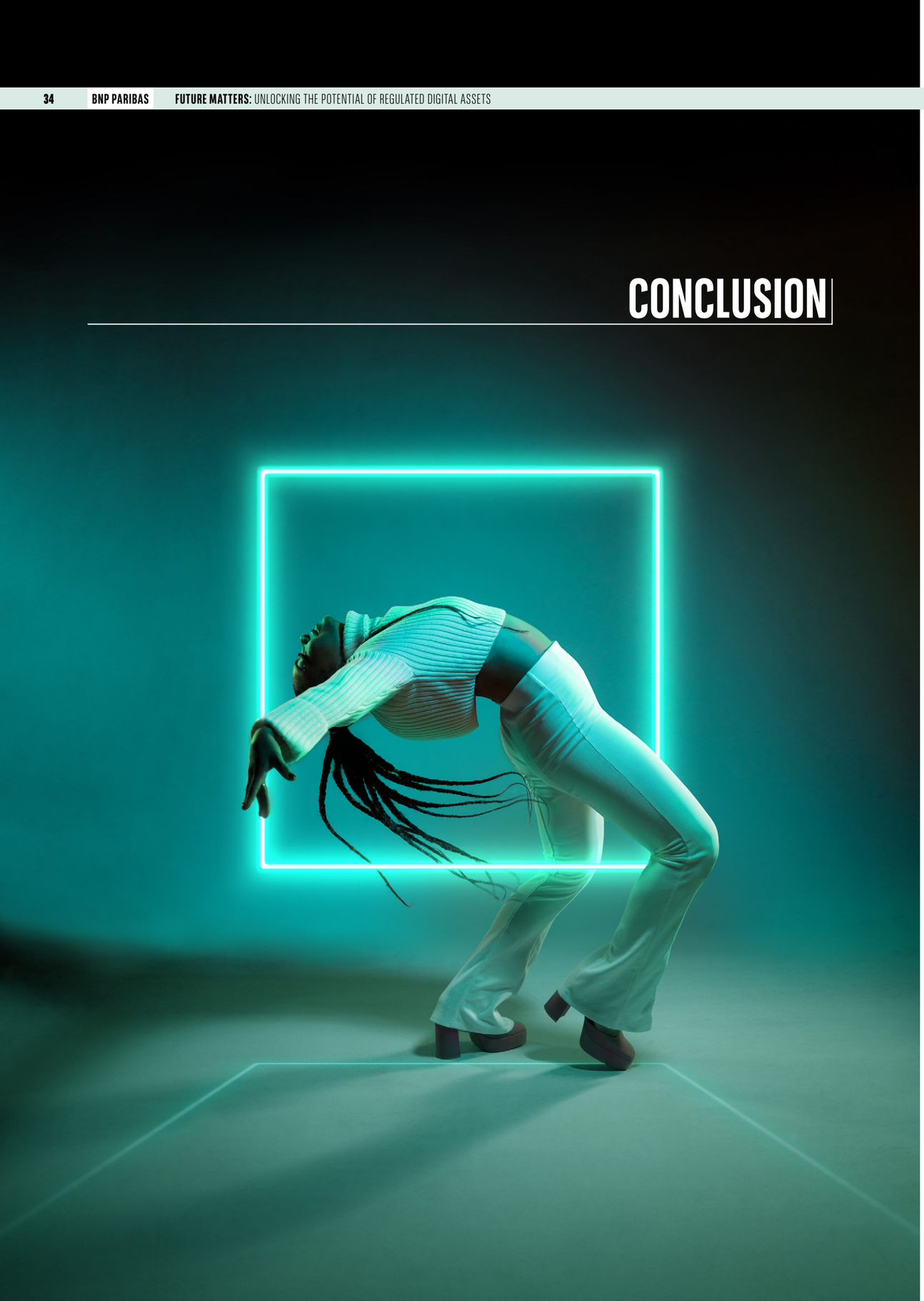

THE ROLE of the custodian will continue to evolve as the traditional and digital asset worlds interact and change over time. Our priority in this new and evolving landscape is to support our clients' current requirements and to stand ready to support any future needs as the regulation and market structure supporting digital assets transforms. We are laying the foundation for potential future services while focusing on experimentation for the near term until the market matures.

Our experimentation in tokenisation has provided our teams from across the business with valuable insights on the current challenges and opportunities that this market poses. We will continue to engage in these proof of concepts and experiments with our interested clients and partners. This will allow us to gain further knowledge of the market as it changes and stay informed of developments such as digital identity and the cash leg of transactions, as they are explored by the industry at large.

Preparing for the future matters and we stand ready to support our clients on their digital asset journey.

PREPARING FOR THE FUTURE MATTERS AND WE STAND READY TO SUPPORT OUR CLIENTS ON THEIR DIGITAL ASSET JOURNEY.

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