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Scaling DLT-based Capital Markets

A Policy Roadmap for the EU

July 2024

Association for Financial Markets in Europe
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July 2024

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The Association for Financial Markets in Europe (AFME) is the voice of Europe's wholesale financial markets.

AFME works to promote a robust, connected and competitive financial system in the EU, UK and globally. providing expertise across a broad range of regulatory and capital markets issues.

We represent the leading global and European banks and other significant capital market players. AFME's members are the lead underwriters of 89% of European corporate and sovereign debt, AFME advocates for deep and liquid secondary market, pursues changes that enable the European green and digital transformations, supports the completion of the Banking Union and Capital Markets Union and connectivity of EU and UK financial markets with the rest of the world.

Contents

Foreword

Distributed Ledger Technology (DLT) holds great potential to expand access to capital markets, improve their efficiency, and promote innovation. Implemented at scale, DLT can make a significant beneficial contribution to the functioning and depth of capital markets, and in doing so, to the real economy.

As highlighted by AFME's complementary *Roadmap Strategy for European Issuers*, market developments are moving beyond proof-of-concept initiatives in DLT-based issuance of bonds, towards issuances with demonstrated liquidity and benefits throughout the security lifecycle. An increasing number of investors, issuers, and other market participants are becoming a part of the DLT-based markets ecosystem.

Key to ongoing scaling DLT-based capital markets are policy and regulatory frameworks that enable – in a sound and secure way – the inclusion of innovative DLT-based business models in financial markets. Indeed, European policymakers have begun to build such a framework by enabling experimentation, including through the DLT Pilot Regime and ECB wholesale CBDC trials and experiments. As DLT in capital markets are now moving into a new phase, Europe has a great opportunity to further develop a more permanent policy framework that helps Europe lead the development of DLT-based capital markets and shape DLT-based market practices and regulatory standards globally.

This Roadmap document was created in collaboration with a variety of stakeholders across the financial ecosystem. The objective of the Roadmap is to unlock outstanding regulatory barriers to the scaling of DLT-based capital markets. It sets out the benefits of DLT-based capital markets and an 8-point plan for policymakers and regulators to pursue a regulatory regime that fully enables the use of DLT.

Adam Farkas
CEO
Association for Financial Markets in Europe

"DLT can make a significant beneficial contribution to the functioning and depth of capital markets, and in doing so, to the real economy"

Executive Summary

The recent years have witnessed an acceleration of the development of Distributed Ledger Technology (DLT) and its use in capital markets. It is widely acknowledged that the use of DLT can bring many transformative benefits and efficiencies for capital markets, through decentralised processing, validation and authentication of transactions and other types of data exchange.[1] **Policymakers and regulators have acknowledged and highlighted the benefits of the use of DLT to capital market** (see Part I – Benefits), and created Sandbox regimes to test the deployment of new technologies. [2]

However, **the current European financial regulatory regime** – which follows the G20 reform programme introduced after the 2009 global financial crisis – **is based on a largely centralised system of financial transactions and data recordings**. While this was appropriate for the aftermath of the crisis, it has also given rise to the concentration of critical market and post-trade operations in few actors that can lead to single-points-of-failures. DLT offers a vision for a more innovative, accessible and resilient *decentralised* financial market infrastructure.

While Europe has been a frontrunner in enabling DLT-based experimentation, the development of DLT-based markets towards scaling has to some extent overtaken the current regulatory regime, which in part inhibits the full deployment of DLT in the financial sector and the further scaling of DLT-based capital markets, including the tokenisation of sovereign, supranational and agency bonds (SSA bonds). These developments, however, also provide Europe with an opportunity now to be a leader in developing a more definitive policy and regulatory regime that enables the secure scaling of DLT-based capital markets. This report focuses on **the policy and regulatory changes that are necessary to enable that development and growth of DLT-based capital markets**.

Overview of policy and regulatory changes required and desired policy outcomes

In updating and adjusting the regulatory and policy framework in light of developments in DLT-based capital markets and to enable further scaling, four key principles should be considered:

1. **Achieving full technological neutrality**
2. **Achieving economic equivalence between DLT-based securities and traditional formats**
3. **Balancing benefits from technology with new risks**
4. **Enabling innovation**

"The development of DLT-based markets towards scaling has to some extent overtaken the current regulatory regime, which in part inhibits the full deployment of DLT in the financial sector and the further scaling of DLT-based capital markets"

1 GFMA Report on Impact of DLT in Global Capital Markets (2023) and AFME Issuer Roadmap for Scaling DLT-based SSA Bond Markets

2 European Commission DLT Pilot Regime Impact assessment

Bearing in mind these principles, the following policy and regulatory change are recommended:

Key themes	Desired policy outcomes
1. Updating DLT Pilot Regime	Enhance attractiveness through increased limits, broadening eligibility for DLT-based settlement systems, explore unbundling of CSD core services at functional level (in line with the UK Digital Securities Sandbox approach), and provide a clear, accommodative and permanent regime
2. Future proofing settlement functions	Allow for the development of decentralised settlement where core CSD services (e.g. settlement, central maintenance of securities accounts, notary) are regulated by function and can be performed by different eligible actors
3. Security record-keeping requirement	Security record keeping requirements should be compatible with the use of DLT, so as to allow DLT-based securities to be eligible for key economic functions
4. Settlement finality	DLT-based securities should be able to benefit from settlement finality
5. Central bank collateral eligibility	DLT-based securities should be able to qualify as central bank collateral
6. Cash solutions	Availability of broad array of cash settlement solutions, including wCBDCs, commercial bank money and qualified stablecoins, and moving towards issuance of tokenised central bank money on asset chain
7. Prudential treatment	Allow banks to explore the use of permissionless blockchains provided they have robust governance, controls, and risk mitigation solutions. DLT-based securities should not be precluded from receiving the same liquidity treatment (including high-quality liquid asset classification) as equivalent traditional instruments
8. Custody of security tokens	Rules on custody should be consistent across European countries in treating DLT-based securities in the same manner as traditional financial instruments

Full Roadmap Preview

This roadmap document focuses on identifying and unlocking policy and regulatory barriers to the adoptions of DLT in markets for bonds issued by European sovereigns, supranational institutions and public-sector agencies.

For further details, please see the following parts of the roadmap document:

- **Part I – Benefits of DLT** setting out how DLT can help policymakers achieve key policy objectives and priorities.
- **Part II – Policymaker Roadmap Strategy** summarising a strategy for European policymakers to implement recommended policy and regulatory actions, including immediate changes (0-2 years) and medium- to long-term changes (2-5 years).

Key terms

The following definitions are used throughout this roadmap document:

Distributed ledger technology (DLT) is a database construct that enables the recording of state updates and transactions of assets between participants in a network. The record of transactions exists on a networked, distributed peer-to-peer system, ensuring simultaneous access, validation, and record updating. The networked database is linked by a collection of nodes operated that verify transactions through a consensus mechanism or protocol.

DLT Platform: DLT-based infrastructure with capabilities to facilitate issuance or representation of assets including financial instruments like bonds on distributed ledger.

Tokenisation: the representation of assets including financial instruments and cash on a distributed ledger, reflecting an ownership right of the underlying asset.

Tokenised bond: a tokenised bond is a bond issued using traditional infrastructures, subsequently immobilised and then represented on a distributed ledger in token form.

Bond token: in contrast to "tokenised bond", "bond tokens" refers to bonds that have been issued solely ('DLT-native') on a DLT platform without any underlying bond in existence on traditional infrastructure.

DLT-based bond: refers to the use of DLT as the underlying technology for a bond and encompasses both tokenised bonds and bond tokens.

Smart contracts: computer code that, following an "if-then" logic, automatically executes all or parts of an agreement between parties when certain preconditions are met.

Part I – Benefits

As discussed in the separate AFME report on *Scaling DLT-Based SSA and Government Bond Markets – A Roadmap Strategy for European Issuers*[3], which is intended to be read jointly with this publication, **there are a number of significant benefits in the use of DLT for capital markets**.

Not only is it critical for European issuers and policymakers to support the growth of and innovation in DLT-based capital markets, **the full deployment of DLT can in turn help European policymakers meet their broader objectives** for financial stability, making capital markets deeper and more efficient, promote technological innovation and international competitiveness. This is further set out in Figure 1 below.

Figure 1: **How DLT in Capital Markets can help achieve key policy objectives**

Policy Objective	Benefit provided by DLT	Benefit materialises
1. Financial stability and resilience of market structure	Operational resilience: reduction of single-point-of-failure risk in financial market infrastructures	Immediately
	Risk reduction: reduction in settlement failure and settlement-related risks due to automated, programmable and atomic settlement	Immediately
2. Efficiency and growth of capital markets	Capital Markets Union – making European capital markets more efficient: offering ability to streamline issuance process and compress execution and settlement time (to T+1, T+0)	Over time
	Capital Markets Union - increasing access to capital markets by streamlining issuance process for smaller corporate issuers	Over time
	Developing intraday repo markets: removing trapped capital through faster mobilisation of collateral compressing execution and settlement	Over time
	Facilitating transition away from paper-based securities (under CSDR)	Immediately
3. Innovation in capital markets	Accelerating the Digital Transition: kick-start innovation ecosystem	Immediately
	Accelerating the Green Transition: DLT-based bonds can embed functionality on proceed allocation and fulfilment of sustainability KPIs	Immediately
	Simplifies issuance process enabling more (and smaller) corporates to finance through markets	Over time
4. International competitiveness of capital markets	Early issuance and engagement enables issuer/jurisdiction to shape the parameters of DLT-based capital markets	Immediately
5. Digital sovereignty	Early involvement will enable European policymakers and market participants to shape the outlines of DLT-based capital markets.	Immediately
	In addition, on-chain central bank money can strengthen digital and monetary sovereignty and take a lead in international monetary transmission through new forms of money	Over time

"The full deployment of DLT can help European policymakers meet their broader objectives for financial stability"

3 This report focuses on the benefits of using DLT primarily from the perspective of policymakers and regulators. For the benefits for issuers, please refer to Annex 1 of AFME's "Scaling DLT-based SSA Bond Markets - Issuer Roadmap" for further background.

Part II – Policy Roadmap

Europe has been among most competitive regions globally for experimentation with the use of DLT in financial markets, not least because European policymakers have acknowledged that "*the existing regulatory framework was not designed with DLT in mind*"[4] and launched key initiatives to address barriers to using DLT, including:

- **Sandbox regimes** to test temporary regulatory modifications
- **Permanent reforms to securities regulation** to classify relevant DLT-based assets as securities
- **Experimentation with DLT-based central-bank money solutions**

However, despite these reforms, there are a number of outstanding legal and regulatory changes required to allow DLT-based capital markets in Europe to reach their full potential and make Europe an even more attractive – and, indeed, a leading - jurisdiction for DLT development and innovation.

8-Point Policy Roadmap

An 8-Point Policy Roadmap is proposed below, in line with the following principles:

Achieving full technological neutrality: following the "substance over form" principle, the use of technology should not impact the regulatory treatment of the relevant service or product. Regulation should not create inappropriate barriers for the development of DLT-based financial instruments, payments or business models.

Achieving economic equivalence between DLT-based securities and their traditional counterparts: the regulatory framework should treat DLT-based securities as economically equivalent to traditional financial instruments in order for DLT-based securities to be attractive to and adopted at scale by underwriting banks and investors. This crucially includes DLT-based securities' eligibility as collateral.

Balancing benefits from technology with new risks: the use of DLT bears multiple benefits from the regulatory perspective, including the reduction of Single-point-of-Failure risks through distributed validation. However, not only does the regulatory regime generally not recognise these benefits, there also remain structuring incompatibilities between the current regime and the use of DLT.

Enabling innovation: the regulatory regime should enable regulated financial institutions to develop new and innovative DLT-based business models in the EU, including on public blockchains. Frameworks - including prudential requirements - that are prohibitive to innovation should be avoided or reassessed.

4 European Commission DLT Pilot Regime Impact assessment

8-Point Policy Roadmap

	Phase 1: Immediate changes	Phase 2: Medium-term changes
1. Updating DLT Pilot Regime	• Quick Fix to DLT Pilot Regime to: - **Raise thresholds** for issue, market size, overall market infrastructure by 5x and increase supervisory flexibility - Broaden **DLT SS eligibility to all regulated Financial Institutions** and remove standalone entity requirement - Allow DLT SS to **perform for one or a combination of CSD core services** - Allow for **settlement in commercial bank money and qualified stablecoins** - Confirmation of **end-date and permanent successor regime**	• Introduce and implement **permanent changes** by end of DLT Pilot Regime (2029)
2. Future proofing settlement functions **3. Making CSD record keeping requirements compatible with use of DLT** **4. Supporting Settlement finality**	• **Targeted regulatory changes** to facilitate technological neutrality: - Clarify that 'book entry' form of security can be held on DLT • **Consult on permanent regulatory changes** on: - Separation of CSD core services by function - Regime for non-systemic digital FMIs - Settlement finality for DLT settlement systems	• **Implement permanent regulatory changes**, depending on DLT Pilot Regime developments and consultation outcome • Explore how to **enable settlement finality on public blockchains**
5. Achieving collateral eligibility	• **DLT-based securities issued through the DLT Pilot Regime should be eligible** as marketable assets accepted by the Eurosystem • The Eurosystem should consider **accepting non-Pilot Regime DLT-based equivalents of securities eligible as marketable assets for collateral purposes.**	• The Eurosystem should allow securities issued through regulated decentralised settlement systems to be eligible as collateral, by aligning its eligibility criteria with the proposed adjusted regime for settlement systems.
6. Providing cash settlement solutions	• Following its trials and experiments on wholesale central bank digital currencies (wCBDCs), the **ECB should extend the solutions and make them available to market participants** • **Provide regulatory clarity on the use of privately created on-chain payment means**, including tokenised commercial bank money, stablecoins and private solutions for tokenised central bank money	• The ECB should **make permanent at least one wCBDC solution and move towards asset-chain issuance** • Depending on DLT Pilot Regime developments, allow cash settlement in privately created on-chain payment means on a permanent basis
7. Proportionate prudential treatment	• Allow for banks to **make assessment of exposures to transactions executed on public permissionless ledgers** for Group 1A treatment[5] • **DLT-based securities should be eligible as high quality liquid assets** under liquidity regulation	*To be implemented as part of Phase 1*
8. Harmonising rules on custody	• **Harmonise** local law to allow for the safekeeping and administration of DLT-based securities and provide the **same treatment as traditional securities**	*To be implemented as part of Phase 1*

5 For more detail, please refer to GFMA response to BCBS consultation on crypto asset amendments (2024)

Point 1. Updating DLT Pilot Regime

Why are changes needed?	
• Due to a high barrier to entry and investment required, participation in the **EU DLT Pilot Regime** has been limited among regulated financial institutions	
What changes do we propose?	
0-2 years	**2-5 years**
• **Increase thresholds** on issue size, market capitalisation and market infrastructure[6] by 5x, with supervisory flexibility to adjust on a case-by-case basis • Make it possible for a **broader range of regulated financial institutions to operate DLT settlement systems** (DLT SS) without the need to establish a new entity for this purpose • Allow DLT SS to **perform one or a combination of CSD core services without full CSD authorisation** (see *Point 2 on future proofing settlement functions* below) • Confirm **the extension of the Pilot Regime until March 2029**, and undertake a consultation on **permanent successor regime** in parallel	• Introduce and **implement permanent changes** by end of the DLT Pilot Regime (exp. 2029)
Benefits of proposed changes	
• **Test regulatory changes required** to deliver on long-term scaling of DLT-based capital markets within a sound regulatory system • Create **incentives for regulated financial institutions** to innovate (leading to system-wide benefits) • **Improve attractiveness** of the Pilot Regime's commercial proposition and its competitiveness vis-à-vis other sandbox regimes	

Background

The EU DLT Pilot Regime provides temporary modifications to the regulatory framework to accommodate the deployment of new technologies in capital markets and particularly to incentivise the growth of market infrastructures using DLT. These modifications allow for a number of key exemptions from the current regulatory regime, including from the requirements to record securities in book-entry form and on settlement finality, subject to meeting certain compensatory measures.

Enhancing attractiveness of participation in the DLT Pilot Regime

Prospective entrants to the DLT Pilot Regime currently face the challenging need to balance investment costs and a high barrier to entry with the commercial viability of operating within the caps on transaction volumes and duration. Dynamics in DLT-based capital markets in recent years - in particular the increased size and frequency of securities issues outside of sandbox regimes - have made the cost-benefit assessment of participating in the EU DLT Pilot Regime in its current form less attractive for financial institutions. [7]

To tilt the investment decision in favour of participation, and to accommodate for changing market developments, a number of areas should be considered as part of a 'quick fix' to the DLT Pilot Regime. These mainly aim to improve incentives for participating in the Piot Regime and enhance certainty regarding the successor regime, as outlined in Figure 2 below.

It is important to note that enhancing the possibilities of operating a DLT SS will also likely enhance participation throughout the DLT Pilot Regime, and therefore innovation across the security lifecycle and ecosystem**.** DLT multilateral trading facilities (MTFs) are reliant on DLT SS or DLT trading and settlement systems (TSS) for the settlement of DLT-based transactions.

6 The EU DLT Pilot Regime caps sovereign and supranational bond issuances at EUR 1bn. A total threshold of the aggregate market value of all DLT financial instruments admitted to trading or recorded on a DLT market infrastructure of EUR 6bn at the moment of admission to trading or initial recording applies, as well as an aggregate market value of EUR 9bn of all the DLT financial instruments that are admitted to trading on a DLT market infrastructure or that are recorded on a DLT market infrastructure.

7 ESMA's letter to the European Commission (2024) identifies a number of challenges, including cash settlement, interoperability, investor protection and international competitiveness

Figure 2: **Solutions for enhancing attractiveness of DLT Pilot Regime participation**

					
	Cost	**Transaction Limits**	**Legal Entity Set-Up**	**Time Limit**	**Lack of Clarity on Exit**
Consideration for prospective participants	The need to balance significant investment costs in new technology and legal entity set-up with potential business opportunities	Attractiveness of Sandboxes restricted due to limits on issue size, market capitalisation and infrastructure, given investment costs	The requirement to set up a standalone entity for full CSD authorisation to be eligible for operating a DLT SS creates significant costs and balance sheet fragmentation	The limited duration of the Sandbox regimes also restricts the attractiveness of Sandboxes, given investment costs	Exit pathway and regime needed to offer maximum market and regulatory certainty and maintain incentives for participants
Solutions	Improve attractiveness of participating in the DLT Pilot Regime by increasing business opportunities and lowering investment costs	Increase transaction limits 5x to bring them in line with the levels to which markets have evolved	Remove requirement to set-up a separate entity and allow for authorisation for individual CSD services (see Point 2)	Provide confirmation of the DLIT Pilot Regime's extension until 2029	Commit to implementing a permanent, successor regime for the new digital FMIs created under the Sandboxes should be in place by the end of the temporary regimes

Point 2. Future proofing settlement functions

Why are changes needed?	
• A key benefit of DLT is that it **enables decentralised settlement**, enhancing the **resilience of settlement infrastructure** • However, the current regulatory framework under CSDR does not allow for such decentralised settlement	
What changes do we propose?	
0-2 years	**2-5 years**
• The European Commission should display clear commitment to enabling innovative DLT-based settlement models by consulting on a regulatory regime that **enables regulation at the level of the core functions/services**, thus enabling both centralised and decentralised settlement • This can be tested through the DLT Pilot Regime (see *Point 1*) and a consultation with stakeholders, which should pave the path towards a permanent regime	• The European Commission should introduce and implement **permanent regime to allow for decentralised settlement** by end of the temporary Sandbox regimes (2029)
Benefits of proposed changes	
• Development of **decentralised settlement and digital FMIs,** which would enhance the resilience of financial system by reducing Single-Point-of-Failure risks • **Promote innovation and competition** through facilitation of new digital FMIs and business models	

Background

The current European regulatory framework assumes a centralised settlement system. It therefore does not allow for the different functions of a securities registrar, provision of securities accounts and settlement to be performed in a decentralised manner by different eligible and authorised actors.

This is at odds with the development of DLT-based capital markets, which are based on a shared-ledger infrastructure to which different market participants have access and can – depending on governance and permissioning – participate in the governance of the ledger.

Decentralised settlement can, moreover, reduce concentration and single-point-of-failure risks[8], **increase infrastructure resilience, promote evolution of different business models, and ultimately improve settlement-system choice for market participants**. Decentralised settlement consists of different eligible and authorised actors to take part in different parts of the settlement value chain (see Figure 3 below). In fact, as highlighted in Figure 4 below, a model of distributed and decentralised settlement would be compliant with the BIS Principles for Financial Market Infrastructures.

Creating a future-proof EU settlement regulatory framework

The EU regulatory framework for settlement should enable decentralised settlement systems by allowing notary, maintenance, and settlement services to be performed separately at the functional level. This can be achieved by altering the EU Central Securities Depositories Regulation (CSDR) in a way that allows for both centralised and decentralised settlement systems under EU regulation.

To enable regulated decentralised settlement systems, individual regulated entities can be authorised to perform one or multiple of the core functions of Notary, Maintenance, and Settlement by running relevant nodes in a DLT-based settlement system. An additional role – that of a regulated DLT Protocol Manager – could be made responsible for the provision and maintenance of the network itself. Providers of core services in a decentralised settlement system should be adequately regulated to the same outcome as the existing framework, and provisions in existing financial-services regulation – including CSDR – could appropriately be applied. Figure 4 below outlines the envisaged roles and services and the types of regulatory requirements than can be applied to them.

8 The Monetary Authority of Singapore's "Global Layer 1 Whitepaper" (2024) states that a DLT-based settlement system maintains benefits for risk reduction: "Under the new arrangements, both cash and securities transactions would be hosted and executed on the same shared ledger infrastructure. This means that cash and securities could be exchanged simultaneously, whereby either both cash and securities legs of a transaction would succeed, or both would fail. This arrangement would minimise the system impact if or when a counterparty defaults."

For additional assurance, oversight can be incorporated in the decentralised infrastructure. This can be achieved either by requiring a governance entity on a permanent basis to preside over the decentralised settlement infrastructure and oversee the different actors - including and in coordination with the DLT Protocol Manager - or by allowing the supervisor to maintain a node in the decentralised settlement system so as to allow visibility on transaction data.

Developing a future-proof, technology-neutral and innovation-enhancing regulatory framework for securities settlement along aforementioned lines would be an absolutely vital step towards scaling DLT-based capital markets in Europe. It would enable decentralised and DLT-based settlement systems, which in turn can help enhance innovation and resilience in market infrastructure, and potentially over time reduce fragmentation in the settlement landscape, helping to enable Capital Markets Union. By appropriately regulating the functions and governance of DLT-based settlement infrastructure, this can be done without introducing additional risks to the system.

More directly, adjusting CSDR to enable regulated decentralised settlement systems would also **allow other challenges related to scaling of DLT-based market to be overcome**. In particular, **qualified DLT-based platforms could become eligible Securities Settlement Systems (SSS)**, which in turn would allow securities issued through them to:

- Become eligible for admission to listing and trading on trading venues
- Become eligible for use in financial collateral arrangements
- Qualify as eligible marketable assets for the purpose of monetary policy collateral under the current ECB eligibility criteria (see *Point 5*).
- Benefit from settlement finality (see *Point 4*).

All of these would significantly enhance the attractiveness, tradability, and function of DLT-based securities, and hence the liquidity and growth of DLT-based capital markets.

Figure 3: **Models for Centralised and Distributed Settlement (see roles explained in table below)**

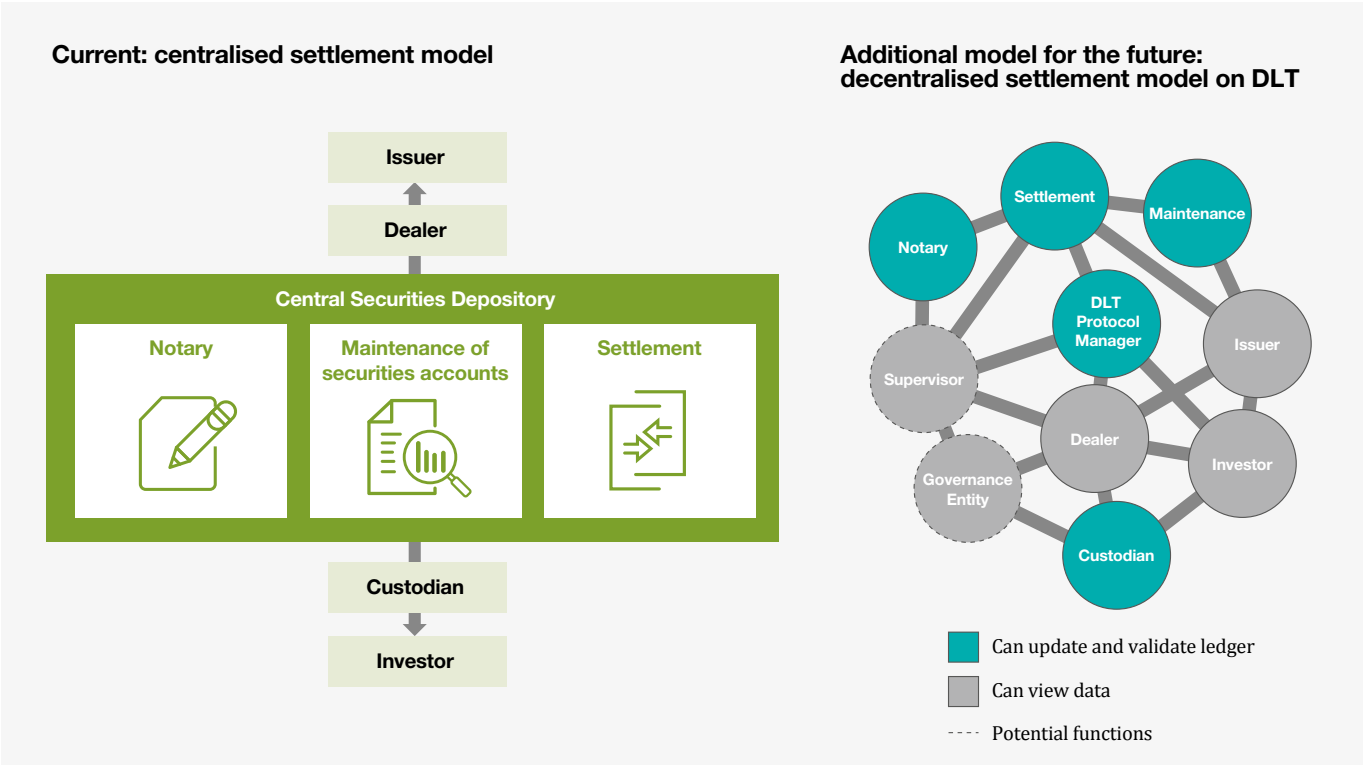

Figure 4: **Settlement Roles – How will functions evolve in a DLT-based (Decentralised) Settlement System?**

International standards	Centralised Settlement Systems under CSDR		Decentralised Settlement Systems (proposed regulatory regime under adjusted CSDR)		
Function in traditional settlement system (under BIS PFMI Principles)	CSDR Core Service Definition	Required to be performed by CSD under PFMI principles?	Service in DLT settlement system	Entities that should be able to provide service	Key regulations that should apply to provision of the service
Securities Registrar[9]	**Notary**: Initial recording of securities in a book-entry system	No, can be a separate registrar	Recording of issues and transactions on DLT ledger by input actors (issuers, dealers, investors, custodians).[10]	CSDs, regulated financial institutions, DLT platforms	• Appropriate and proportionate CSDR requirements, including: - Authorisation - Organisational requirements • Anti-Money Laundering (AML) Regulation[11] • Digital Operational Resilience Act (DORA)
Provision of Securities Accounts	**Central maintenance service**: providing and maintaining securities accounts at the top tier level	Yes, the definition of a CSD is one that provides securities accounts, central safekeeping services, and asset services	Updating and validating the ledger to reconcile records on transfers. May not need to be centralised.	CSDs, custodians, DLT platforms	• Appropriate and proportionate CSDR requirements, including: - Authorisation - Organisational requirements - Protection of securities and asset segregation • AML Regulation • DORA
Securities Settlement System	**Settlement service**: operating a securities settlement system	No, can be CSDs, CCPs, as well as commercial bank functions involving securities transfers	Processing and validating transactions between input actors	CSDs, regulated financial institutions, DLT platforms	• Appropriate and proportionate CSDR requirements, including: - Authorisation - Organisational requirements - Settlement finality[12] - Client asset segregation - Appropriate prudential requirements • AML Regulation • DORA
New functions			*New function:* **DLT Protocol Manager**: providing and maintaining the network	DLT platforms, ICT service provider	• New dedicated rules • DORA
			New potential function: **Governance entity:** presiding over the decentralised settlement framework and overseeing the different actors	CSDs, regulated financial institutions, DLT platform, authorised third-party governance entity.	• New dedicated rules, organisational rules, governance and supervision

Point 3. Making CSD Security Record-Keeping Requirements Compatible with the Use of DLT

Why are changes needed?	
• Securities have to be registered with a CSD in book entry form to be eligible to perform a number of key economic functions: - Admission to on-venue trading - Financial collateral arrangements (and relatedly, as central bank collateral) • There is uncertainty as to whether the "book-entry form" registration requirement encompasses DLT solutions.	
What changes do we propose?	
0-2 years	**2-5 years**
• The European Commission should clarify that the recording of securities in **"book-entry form" can be done on DLT** (under Art. 3 CSDR)	• The European Commission should **broaden the permission to satisfy the security registration requirement to all eligible securities registrars**, including decentralised settlement systems, by end of the DLT Pilot Regime – see *Point 2* for more detail
Benefits of proposed changes	
• Improve investor access and deepen secondary market liquidity • Ability to mobilise DLT-based securities as financial collateral, which could remove trapped capital from the financial system and enhance (intraday) securities lending and collateral markets • Achieve economic equivalence between DLT-based securities and traditional instruments • Promote innovation and competition through facilitation of new digital FMIs and business models	

Background

DLT-based securities have to be recorded and represented in book-entry form in a CSD in order for them to be admitted to trading on trading venues (Regulated Markets, Multilateral Trading Facilities and Organised Trading Facilities) or be used as financial and central bank collateral.

Ensuring technology-neutrality in securities registration

There is uncertainty as to whether the book-entry form recording requirement is compatible with DLT-based settlement systems, where such recording occurs through the creation of tokens. Therefore, **clarification that DLT-based systems can indeed be used to record securities** would provide certainty and ensure the technology-neutrality of regulation with respect to book-entry requirements.

"Clarification that DLT-based systems can be used to record securities would provide certainty and ensure technology-neutrality of regulation"

Point 4. Supporting Settlement Finality

Why are changes needed?	
• Settlement finality rules ensuring the enforceability and binding character of transfer orders only apply to CSD-operated Securities Settlement Systems (SSS) • As a substantial portion of the DLT ecosystem currently does not comply with the definition of SSS, transfer parties of DLT-based securities do not benefit from legal certainty on settlement finality, netting and insolvency remoteness. This leads to a lack of certainty for investors.	
What changes do we propose?	
0-2 years	**2-5 years**
• The European Commission should **review the applicability of existing settlement finality rules to DLT-based securities**, by either providing an exemption from the rules subject to certain compensatory measures or allowing settlement finality to be satisfied through an assessment by regulated financial institutions	• DLT SS should qualify as SSS under revised CSDR (see point 2) and thus **benefit from settlement finality** • Explore how to enable **settlement finality on public blockchains**
Benefits of proposed changes	
• Provide necessary regulatory certainty to market participants • Facilitate innovation in medium- to long-term, including of public ledgers	

Background

Settlement finality rules provide for the legal enforceability and binding character of transfer orders and netting despite the insolvency of a participant, and currently only apply to Securities Settlement Systems (SSS) which under the CSDR have to be operated by CSDs[13]. As most DLT-based platforms do not qualify as SSS, investors of DLT-based securities issued by these platforms do not benefit from settlement finality.

Enabling DLT-based securities to benefit from settlement finality

It should therefore be considered how DLT-based platforms can support settlement finality. There are two solutions available in the immediate term:

1. **Whether an exemption from the settlement finality rules can be allowed subject to compensatory measures**. Such measures can include insolvency remoteness and protection measures, from the DLT-based platform being in place. Such arrangements are currently available under the DLT Pilot Regime and could be extended to other DLT platforms outside this Regime.

2. **Allowing for regulated financial institutions to conduct an assessment relating to settlement finality in a DLT-based platform,** which should consist of:[14]

    1. Clear outline of processes as to how and when settlement of the transaction is achieved - whether pursuant to a bilateral contract or the rules or technical processes or conventions of the relevant market, exchange, venue, or DLT-based platform[15]; and

    2. A legal review of the settlement process which has concluded that settlement finality is achieved or is likely to be achieved in practice.

13 Under Directive 98/26/EC of the European Parliament and of the Council of 19 May 1998 on settlement finality in payment and securities settlement systems

14 For more detail, please refer to GFMA response to BCBS consultation on crypto asset amendments (2024)

15 As highlighted by the Monetary Authority of Singapore's "Global Layer 1 Whitepaper" (2024), DLT-based settlement systems should be able to define that settlement is considered final and irrevocable, once a predetermined number of validating nodes (operated by qualified counterparties and actors) have achieved consensus on the state of the ledger.

In the medium-term, the creation of a permanent framework for DLT-based settlement systems as outlined in *Point 2* should over the medium-term resolve the settlement finality concerns. The proposed framework would allow both for the continuation of centralised settlement as well as the development of decentralised settlement (as proposed in *Point 2*) and DLT-based settlement systems would qualify as SSS, thereby benefitting from settlement finality in a similar way to existing SSS.

Settlement Finality on Public Blockchains

It remains unclear how the legal definition of settlement[16] applies to transfers of DLT-based securities on public blockchains, which operate on the basis of a consensus mechanism between peer validators (or miners) as opposed to a third-party intermediary performing the settlement function in the traditional infrastructure.

It is advisable for policymakers to consult on and consider **whether the definition of settlement finality needs to be amended to allow for market scaling on public blockchains as the settlement layer**, and under what conditions.

"It is advisable for policymakers to consult on and consider whether the definition of settlement finality needs to be amended"

16 Defined as "*the completion of a securities transaction where it is concluded with the aim of discharging the obligations of the parties to that transaction through the transfer of cash or securities, or both*" under CSDR Art. 2(1)(7)

Point 5. Achieving Collateral eligibility

Why are changes needed?	
• The ECB does not accept DLT-based securities as collateral for monetary-policy purposes. This undermines their economic value and attractiveness to investors[17]	
What changes do we propose?	
0-2 years	**2-5 years**
• **DLT-based securities issued through the DLT Pilot Regime (with security registration exemption) should be eligible** as marketable assets accepted by the Eurosystem • The Eurosystem should consider **accepting non-Pilot Regime DLT-based equivalents of securities eligible as marketable securities** for monetary-policy collateral purposes.	• The Eurosystem should align its eligibility criteria with the adjusted regime for settlement systems (see *Point 2*).
Benefits of proposed changes	
• Provide for faster mobilisation of collateral compared to traditional instruments • Achieve economic equivalence between DLT-based securities and traditional instruments • Provide source of liquidity to underwriting banks (otherwise liquidity would need to be separately sourced, which increases costs)	

Background

The eligibility of DLT-based securities as financial collateral (see *Point 3*) and central bank collateral is of key importance to their value and attractiveness to investors, as well as for banks' ability to underwrite the securities and act as market makers. This is an important step to scaling of DLT-based capital markets. In particular, given the importance of bonds issued by highly-rated sovereigns, agencies and corporates to central bank market operations and for monetary policy transmission, **DLT-based bonds should be accepted by the Eurosystem as collateral**.

However, under the Eurosystem's current criteria, DLT-based securities are generally ineligible as marketable collateral. This is because securities, in order to meet the eligibility criteria, generally have to be transferable in book-entry form, held and settled with an eligible Securities Settlement System (SSS), and admitted to listing and trading on a regulated market. As DLT platforms do not currently qualify as SSS, DLT-based securities are generally ineligible for classification as marketable assets for collateral purposes. This is despite their having the same credit quality and characteristics as their traditional equivalents that are accepted as marketable collateral.

Ensuring collateral eligibility of DLT-based securities issued through DLT Pilot Regime

The DLT Pilot Regime aims to address this conundrum and enable admission to trading for DLT-based securities by granting authorised DTL SS an exemption from CSD registration requirements (Art 3 CSDR). That (conditional) exemption also makes DLT-based securities eligible for financial collateral arrangements and enables admission to trading on a trading venue, thus enabling secondary-market and repo transactions.

Given that the Pilot Regime enables marketability of DLT-based securities, the ECB should **accept DLT-based securities issued through the DLT Pilot Regime with a CSD registration exemption that otherwise meet the eligibility criteria for marketable assets.** Such an approach would also be consistent with that taken by other central banks: the Bank of England treats DLT-based securities issued through the UK's Digital Securities Sandbox as eligible for securities financing transactions and as collateral.

17 As a prerequisite for central bank assessment, assets need to be eligible as financial collateral (see above on CSD record-keeping requirements)

Collateral eligibility of DLT-based securities issued outside DLT Pilot Regime

The ECB should also consider accepting DLT-based securities issued outside the DLT Pilot Regime as eligible marketable collateral. Such DLT-based securities may currently be eligible only as non-marketable assets, due to a lack of listing and trading eligibility as a result of being issued through DLT platforms and not registered with CSDs. To achieve technology-neutral treatment, the ECB should consider to grant DLT-equivalents of traditional securities eligible for collateral as marketable assets should be given the same designation.

Such a decision could also help achieve the ultimate aim of the ECB's marketability criteria, i.e. sufficiently liquid markets: collateral eligibility as a marketable asset would enhance the attractiveness of the DLT-based equivalent assets and significantly enhance the liquidity of such instruments, for instance through transactions in DLT-based repo markets.

Aligning ECB criteria with proposed updated regulatory regime for settlement systems

Updating the CSDR to enable DLT-based settlement systems (as proposed under *Point* 2) can in the medium-term resolve uncertainty around collateral eligibility: such a regime would enable DLT-based platform to be recognised as Securities Settlement Systems (registration with a securities registrar and validated by a settlement system), thus enabling alignment with ECB eligibility criteria.

"The ECB should consider accepting DLT-based securities issued outside the DLT Pilot Regime as eligible marketable collateral"

Point 6. Providing Cash Settlement Solutions

Why are changes needed?	
• Settlement of securities transactions in central-bank money minimises counterparty risk and is generally a regulatory requirement (e.g. CSDR Art 40). • A DLT-based central-bank money solution is therefore key to achieving scale in, and reap full benefits and efficiencies of, the use of DLT in capital markets	
What changes do we propose?	
0-2 years	**2-5 years**
• The ECB should **extend the current trials and experiments on wholesale central bank digital currencies** (wCBDCs), with a **clear commitment to making solutions available** to market participants • The European Commission should provide **regulatory clarity on privately-created on-chain payments means**: stablecoins, commercial bank money and private solutions for tokenised central bank money	• The ECB should make permanent **at least one wCBDC solution** and begin work on a **distribution solution**, under which tokenised central bank money can be issued directly onto selected market (asset) chains • Depending on Pilot Regime developments, the European Commission should allow cash settlement in tokenised commercial bank money and qualified stablecoins on a permanent basis
Benefits of proposed changes	
• Allowing on-chain Delivery-versus-Payment (DvP), which would lead to benefits such as settlement programmability and atomic settlement (if desired) • Allows for the innovation and development of on-chain central bank money, including solutions currently being tested by the ECB[18] • Accelerate development of qualified and regulated stablecoins and their market growth • Accelerate innovation by banks through the development of tokenised commercial bank money solutions	

Effective and efficient means of DLT-based cash solutions are key to achieving important benefits offered by DLT, in particular the ability to achieve transaction programmability, and, if desired, atomic settlement (with all components of a transaction executed precisely and/or simultaneously). Transactions in DLT-based securities transactions – e.g. bond issues - have been settled using different cash solutions (see Annex to this document for an overview).

To facilitate further DLT-based market scaling, two key types of DLT-based cash solutions are needed with respect to DLT-based cash:

1. Publicly-provided central bank money solutions

2. Regulatory clarity on the use of privately created, on-chain payment means, including commercial bank money, stablecoins, and private solutions for tokenised central bank money.

These are further outlined below:

DLT-based Central bank money

Availability of risk-free central-bank money settlement is key for the development of wholesale DLT-based markets. Central-bank money provides minimal settlement risk and is therefore the cash solution of choice in important wholesale markets. Moreover, the ability to settle in central-bank money settlement may also be of great importance for (debt) issuers and is generally mandated by settlement regulation (e.g. Art 40 CSDR).

18 See for further background on the solutions and Eurosystem exploratory work on wCBDC: https://www.ecb.europa.eu/paym/groups/ntwcg/pdf/ecb.ntwdocs230621_presentations_1st_ntwcg_meeting.en.pdf?ad23790ed6c7b52edb21e9976f05e0d6

The ECB and National Central Banks have gained significant experience in the use of DLT-based central-bank money: National Central Banks have provided links between distributed ledgers and central bank money, most notably by the Banque de France in issuance of tokenised EIB bonds. Moreover, the Eurosystem is currently engaging in exploratory work for both trials (real transactions) and experiments (mock transactions), in which three different solutions provide linkages between chains and TARGET 2 for a period of up to 6 months. These solutions have gained significant market interest.

Certainty around the continued availability of DLT-based central-bank money in the Euro Area is vital for continued innovation and investment in DLT-based markets. In order to achieve this, the ECB should take the following steps:

1. **Extend the current trials and experiments beyond November 2024** to ensure continued availability of DLT-based central-bank money solutions. Such an extension would be best be communicated in advance of the end of the experiments and trials and would be warranted given the significant participation in the experiments and trials, in line with the recent extension announced by the Swiss National Bank.

2. **Combine the extension with a commitment from the ECB that DLT-based central-bank money will be available over the medium and longer-term,** even as the specific form such solutions take may evolve over time. It is advised to consult with industry on the form, functionality, timing and criteria of such a medium-term solution.

3. **In 2025, announce a decision to move towards at least one operational solution.** At least one of the three solutions should be made available on a permanent basis.

4. **Begin exploration of a distribution solution and possible criteria for issuance onto market ledgers.** In the longer-term this could be preferable as, compared to other possible definitive solutions, it would ultimately fully integrate asset and cash ledgers and eliminate risks from chain bridges.

Privately cash settlement instruments:

Bringing other forms of payment instruments on-chain can also play a key role in enhancing settlement efficiency. While central bank money is a vital and preferred cash settlement solution in some markets, commercial bank money settlement on-chain can be of great added value too, including in markets where such settlement is common.

In addition to traditional cash settlement solutions, DLT-based solutions also include stablecoins. MiCA-regulated stablecoins have to comply with stringent reserve-backing and governance requirements and can as such be appropriate settlement instruments.

Providing clarity on the use of DLT-based commercial-bank money and stablecoins in settlement is of great importance to further market development. The DLT Pilot Regime enables the use of such instruments by providing an exemption from Art. 40 of CSDR, and it should be considered whether this exemption can be extended to the cash settlement of DLT-based security transactions outside of the Pilot Regime and for continued use in regulated decentralised settlement systems after the conclusion of the Pilot Regime.

Point 7. Proportionate Prudential Treatment

Why are changes needed?	
• DLT-based securities do not benefit from the same capital and liquidity treatment as traditional securities	
What changes do we propose?	
0-2 years	**2-5 years**
• The implementation of BCBS standards on crypto assets **should not penalise transactions solely on the basis of the use of public, permissionless blockchains**.[19] • Existing liquidity regulation should not preclude DLT-based securities from receiving the **same treatment as traditional securities**.	• *To be implemented as part of Phase 1*
Benefits of proposed changes	
• Enable banks to underwrite, distribute and act as market makers for DLT-based securities • Enable broader innovation and experimentation with, and investment in, public ledgers in the medium- to long-term	

Background

Lack of technology neutrality in capital and liquidity regulation can prove a significant obstacle to DLT-based market development. In particular, divergent prudential treatment can create obstacles for banks to act as underwriters and intermediaries (including market makers) for DLT-based securities, as this would unduly penalise their balance sheets.

Below the prudential treatment of DLT-based securities will be assessed further:

Capital regulation

The Basel Committee for Banking Supervision (BCBS) published an update on prudential treatment of crypto-assets in May 2024.[20] Under these rules, capital treatment is differentiated between DLT-based assets, with DLT-equivalents of traditional securities receiving in principle the same capital treatment as those traditional securities.

However, the BCBS rules assign a punitive risk weight of 1250% to all DLT-based securities transacted on permissionless blockchains, even when such securities meet the classification conditions of tokenised traditional assets. This is due to a number of 'unique risks'[21] in the use of permissionless blockchains identified by the BCBS.

The punitive prudential treatment is expected to restrict banks' investment and participation in capital-market transactions on public blockchains, given the outsize balance-sheet impact such participation would have. An unintended consequence is that markets can be driven towards non-bank financial institutions / shadow banking space.

The use of prudential rules to resolve perceived risks should be avoided. This is especially the case as banks have sufficient expertise and robust compliance frameworks to mitigate the risks of using a permissionless blockchain as a base layer for the issuance of DLT-based securities, including limiting counterparty participation through whitelisting.

It is therefore advised that – in the EU's transposition of the BCBS rules - banks be allowed to make an assessment of whether exposures to DLT-based security transactions executed on permissionless ledgers should be eligible for the same prudential treatment as the underlying securities or equivalent traditional formats. In this assessment, banks should consider certain important criteria such as robust governance, controls and risk mitigating solutions.

19 For more detail, please refer to GFMA response to BCBS consultation on crypto asset amendments (2024)

20 https://www.bis.org/press/p240513a.htm

21 The risks identified include reliance on third-party to carry out basic operations, policy, legal, AML/CFT risks, and risks around settlement finality, privacy, and liquidity

Liquidity regulation

Liquidity regulation seeks to ensure that banks have an adequate stock of unencumbered high-quality liquid assets to meet liquidity needs in stress and maintain a stable funding structure. Typically, assets representing claims on EU governments, central banks and multinational agencies are eligible as Level 1 assets (assets of extremely high liquidity and credit quality) for the purpose of satisfying the Liquidity Coverage Ratio.

Traditional and DLT-based bonds issued by the same issuer generally have the same credit quality, and the DLT-based format should not be excluded from qualifying as high-quality liquid assets. This should also be extended to the calculation of the Net Stable Funding Ratio, such that it should not be precluded that DLT-based assets receive the same required stable funding factor as their traditional equivalents.

"Lack of technology neutrality in capital and liquidity regulation... can create obstacles for banks to act as underwriters and intermediaries (including market makers) for DLT-based securities"

Point 8. Harmonising Rules on Custody

Why are changes needed?	
• A lack of legal and regulatory consistency in rules governing the custody of DLT-based securities between Member States impedes at-scale custodian connectivity to DLT platforms, and therefore also impacts investor access to DLT-based instruments.	
What changes do we propose?	
0-2 years	**2-5 years**
• EU and national authorities should **promote harmonisation in national custody legislations and regulatory guidance** such that same rules are provided for DLT-based securities as traditional securities	• *To be implemented as part of Phase 1*
Benefits of proposed changes	
• Facilitate custodians' participation in DLT-based markets, which benefits investor participation, primary market scaling, secondary market liquidity and financial stability • Preserving market functioning and arrangements for instruments that meet the definition of financial instruments	

Background

Lack of harmonisation in the legal frameworks and regulatory frameworks governing custody for DLT-based securities impedes development of custodial services for DLT-based securities.

Custody rules for traditional financial instruments - which largely stem from national law and EU and national-level regulations - are fragmented. This is exacerbated by a lack of clarity on the treatment of DLT-based securities and by divergent treatment of DLT-based securities compared to traditional financial instruments.

Moving towards consistency and technology neutrality

- **Legal frameworks**: consistency across national legislations would help resolve national and cross-border issues in the safekeeping and administration of DLT-based securities. Without such consistency, there remains uncertainty for market participants on the enforceability of rules applicable to the transfer and disposition of rights, insolvency protection measures, and dispute resolution mechanisms, and ultimately complicate at-scale provision of custody services for DLT-based securities.

- **Regulatory frameworks**: regulation and guidance on the custody of DLT-based instruments should be consistent across Member States, and technologically neutral. National regulations should consistently refer to the updated EU definition of financial instruments, which includes those "*issued by means of distributed ledger technology*".[22]

22 As amended by the DLT Pilot Regime Regulation and also taking into account ESMA's guidelines on criteria and conditions on the qualification of crypto assets as financial instruments.

Annex

Figure 5: **Comparison of attributes and regulatory treatment of different cash solutions in Europe (EU & UK)**

Cash solution	On-chain (DLT-based) or off-chain (traditional)?	Risk-free?	Currently available?	Allow for use in Sandboxes?	Allow for regular use?	Additional regulatory, operational, interoperability considerations?
TARGET2 (Euro Area)	**Off-chain**	Yes	Yes	Yes	Yes	Does not allow for DLT capabilities
RTGS (UK)	**Off-chain**	Yes	Yes	Yes	Yes	Does not allow for DLT capabilities
SICSystem (CH)	**Off-chain**	Yes	Yes	Not applicable	Yes	Does not allow for DLT capabilities
Helvetia SNB wCBDC Pilot (CH)	**On-chain**	Yes	Yes – on a pilot basis	Not applicable	Yes	Direct issuance onto market asset ledger
Sterling Fnality Payment System (UK)	**On-chain**	Yes	Yes	Yes	Yes	Interoperability required with DLT platforms and CSD
ECB T&E - Banque de France wCBDC integrated solution (EU)	**On-chain**	Yes	Yes – for experiments and trials	Tbd	Tbd	Interoperability between BdF ledger and asset ledger
ECB T&E - Bundesbank wCBDC trigger solution (EU)	**On-chain**	Yes	Yes – for experiments and trials	Tbd	Tbd	Trigger chain between Bundesbank ledger and TARGET2
ECB T&E – Banca d'Italia hash-link solution (EU)	**On-chain**	Yes	Yes – for experiments and trials	Tbd	Tbd	Communication via API between an asset ledger and the TARGET2
Tokenised commercial bank money	**On-chain**	No, but reserve backing reduces settlement-related risks	Yes	Permitted	No – clarification on eligibility required	Regulatory clarity needed
Stablecoins	**On-chain**	No, but high backing asset and capital requirements reduce settlement-related risks	Yes, but not eligible for cash settlement outside of the DLT Piot Regime	Permitted under the EU DLT PR (MiCA EMTs issued by credit institutions), but the UK DSS does not propose to allow stablecoins as payment instruments	No	Approval under MiCA and future UK regime required

/ About AFME

The Association for Financial Markets in Europe (AFME) is the voice of all Europe's wholesale financial markets, providing expertise across a broad range of regulatory and capital markets issues.

We represent the leading global and European banks and other significant capital market players.

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