

Agenda item 1: Presentation on Project Meridian FX by BIS Innovation Hub

Background: as part of the presentations on international DLT-related initiatives, the BIS Innovation Hub presented project Meridian FX, which is a joint project by the Eurosystem and London Centres of the BIS Innovation Hub, as well as the Bank of England, the Deutsche Bundesbank, the Banque de France, the Banca d'Italia, and the ECB to test synchronised settlement in foreign exchange (FX).

The project will provide insights on how ledgers across two real-time gross settlement (RTGS) systems could interoperate using a “synchronisation operator”, as well as with new technologies, such as distributed ledger technology (DLT). The experiments will involve connecting Meridian FX's synchronisation operator to the three interoperability solutions being explored as part of the Eurosystem's exploratory work, as well as the Bank of England's CHAPS system emulator.

A background image showing a complex network of glowing blue lines and nodes, with currency symbols like \$, €, and ¥ scattered throughout, suggesting a global financial network or data flow.

Project Meridian FX

Improving FX transactions through synchronised settlement

ECB New Technologies in Wholesale Settlements Contact Group, 26 November 2024

Presentation by BIS Innovation Hub Eurosystem Centre

Project Meridian (2023) was the genesis of Project Meridian FX

- Project Meridian, run by the London Centre and Bank of England, was completed in 2023, and experimented with the concept of **synchronisation via a synchronisation operator**.
- Synchronisation involves settling a transaction using central bank money in an RTGS system - funds move **if and only if** an asset on another ledger also moves, reducing risks and increasing efficiencies.
- Project Meridian built on the existing concept of **interlinking asset ledgers with RTGS systems**, but demonstrated how a synchronisation operator can orchestrate **synchronised settlement in central bank money** using housing transactions in the UK as an exploratory use case.

Project Meridian Overview

1 Request settlement service

To start a transaction, counterparties appoint a synchronisation operator.

2 Buyer commits funds

Reservation of the buyer's funds for the transaction by applying a hold is instructed.

3 Funds reserved

To prevent the funds or assets being used in other transactions, an earmark is placed. This can last for minutes, and approval is needed before they are placed.

4 Settlement

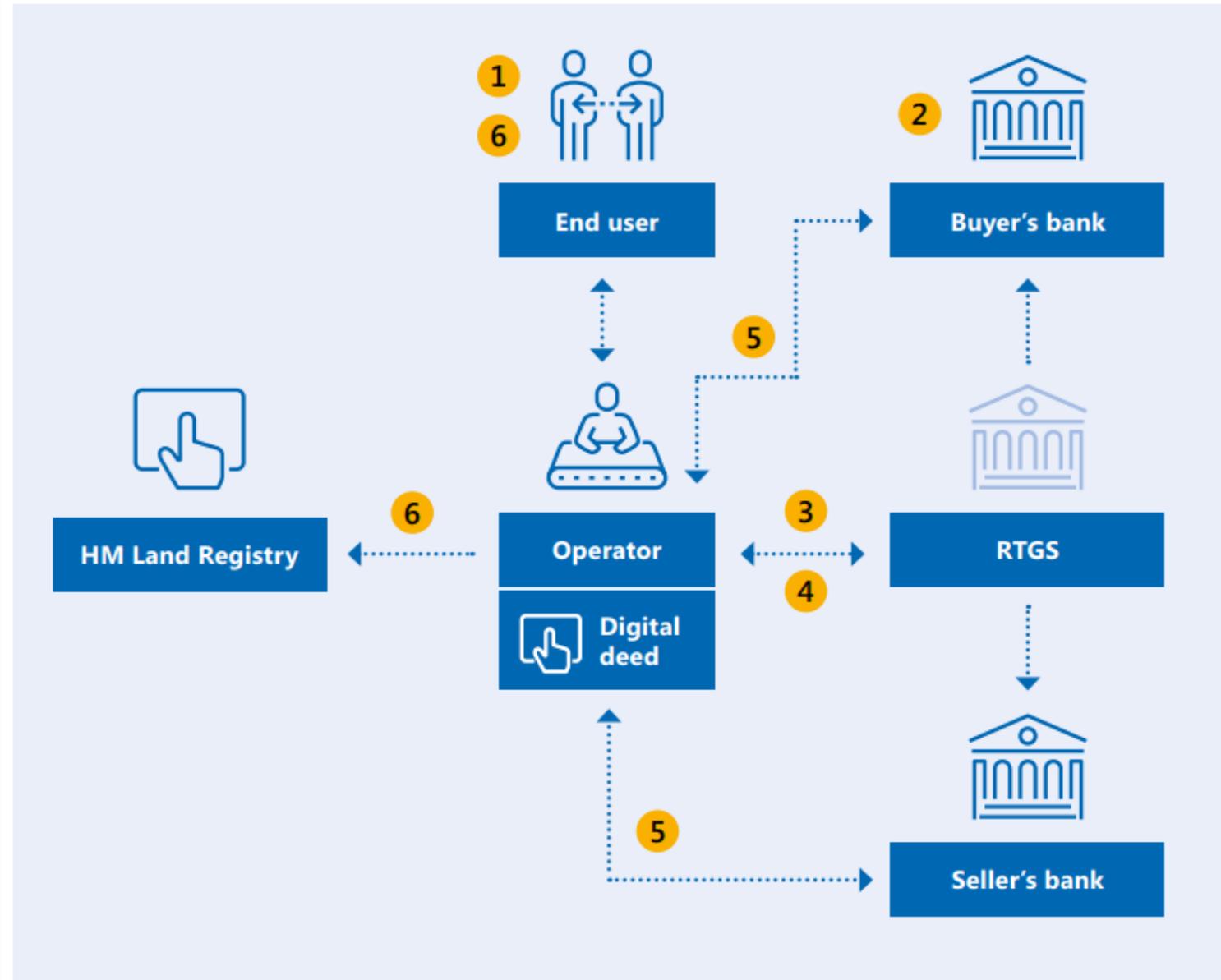
Final settlement is achieved when the synchronisation operator instructs funds to move from the buyer's bank to the sellers in the RTGS system. Ownership of the asset changes.

5 Balances updated

The buyer's and seller's bank account balances are updated after settlement finality is achieved.

6 Confirmation of settlement

End users receive confirmation that the transaction has been completed, and the digital deed is sent to HM Land Registry. Remaining steps in the house purchase process can now occur.



The Project Meridian report recommended applying the Meridian prototype to FX transactions

- The Project Meridian report noted that achieving **synchronous settlement** for a **foreign exchange transaction** would involve **simultaneous actions** in RTGS systems **in two jurisdictions**:
 - A prototype would need to **send symmetric instructions to two RTGS systems**, one for each currency.
 - Then, once **earmarks are confirmed** in both currencies, the synchronisation operator could **trigger settlement across the two RTGS systems simultaneously**.

Project Meridian FX: Objectives

- Meridian FX builds upon the concept of the synchronisation operator (SO) from Project Meridian and explores or experiments with connecting asset ledgers across **two RTGS systems** based in different jurisdictions.
- The RTGS connections also include those which are **DLT-based**, in order to test how the SO could support interoperability between existing and new technologies.
- The aim is to successfully orchestrate the settlement of a **payment versus payment (PvP) instant FX transaction**.

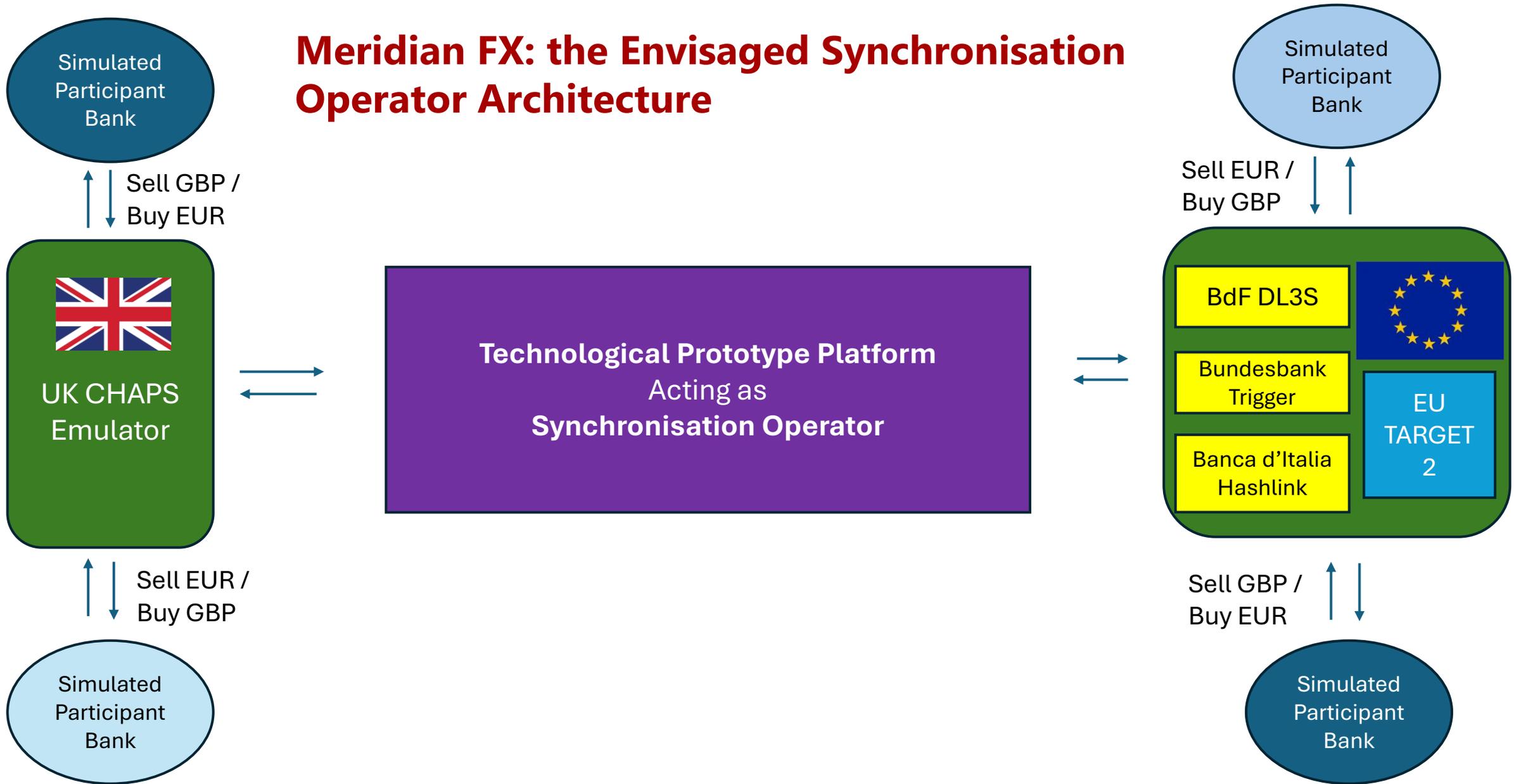
Meridian FX: Further Detail on Objectives

- **Core Objectives:**
 - Synchronised settlement of PvP involving different RTGS systems
 - Synchronised settlement of PvP involving ledgers based on different technologies (central and DLT)
- **Extension Objectives:**
 - Liquidity: How might a synchronisation operator minimise liquidity needs?
 - Control points: How might a synchronisation operator balance the need for (user) control points with other considerations?

Meridian FX: Actions

- Meridian FX is a joint project between the BIS Innovation Hub's **London Centre** and **Eurosystem Centre**.
- Meridian FX tests mock connections between the **Bank of England's CHAPS RTGS** system, and the **Eurosystem's TARGET 2 RTGS** system. The goal is to demonstrate a successful **GBP:EUR transaction**.
- On the EUR side, the experiments use **the Eurosystem's three potential solutions** for wholesale central bank settlement interaction between TARGET services and DLT platforms. These are:
 - The Banque de France's DL3S DLT solution
 - The Banca d'Italia's TIPS-Hash-Link solution
 - The Bundesbank's Trigger solution

Meridian FX: the Envisaged Synchronisation Operator Architecture



Meridian FX: The Timeline

Early June 2024: Public launch

Sept-Dec: Run core experiments

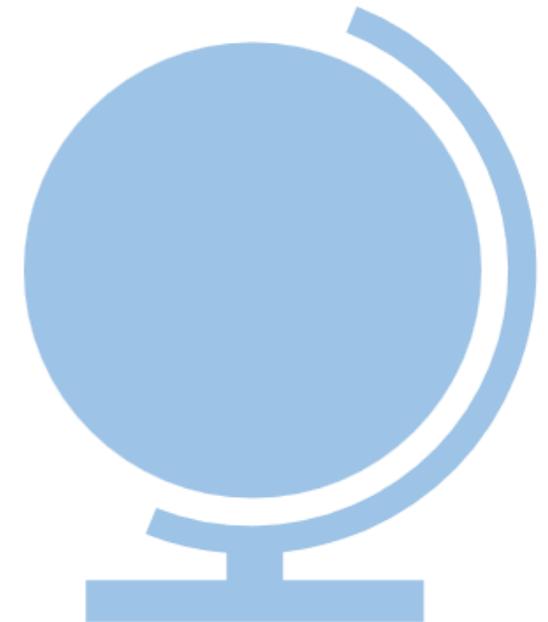
Dec 2024 -Jan 2025: Work on extension objectives

Spring 2025: Publish report



Thank you for your attention!

Questions anyone?



Agenda item 2: Presentations by CG members on keeping momentum, a cooperative ecosystem and avoiding fragmentation from members' perspective

Background: Multiple CG members volunteered to present their view on (some of) the following questions:

- Keeping the momentum after the exploratory work: how does your institution plan to keep the momentum in the work on DLT-based ecosystem/transactions? (Irrespective of what the Eurosystem will decide)
- Towards a cooperative ecosystem: if your institution is involved in any cooperative initiative towards, for e.g., a market neutral platform or open ecosystem: (i) what are the main practical challenges being encountered for e.g., in designing the governance structure / collaboration model, take technological decisions while the market is evolving, obstacles in legal or regulatory constraints to build such ecosystem. (ii) How is your institution facing these challenges
- How to avoid fragmentation and the creation of asset silos: practical experience in solutions and approaches to address this

Towards DLT-Based Capital Markets - Next Steps

NTW-CG
26 November 2024



Market interest in DLT is growing and ECB trials/experiments have substantially boosted momentum



CB availability spurred market interest in DLT-based transactions

- Members report increase in client interest as a result of trials and experiments



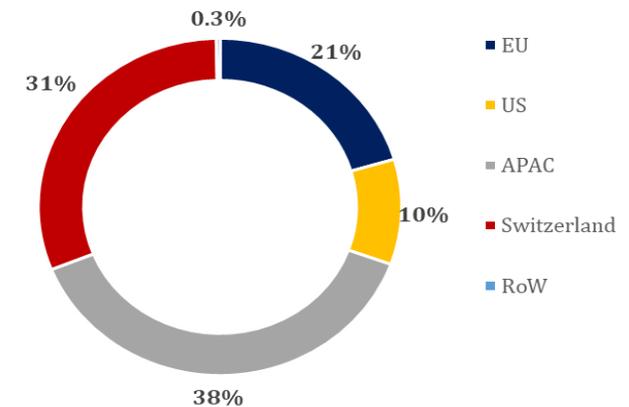
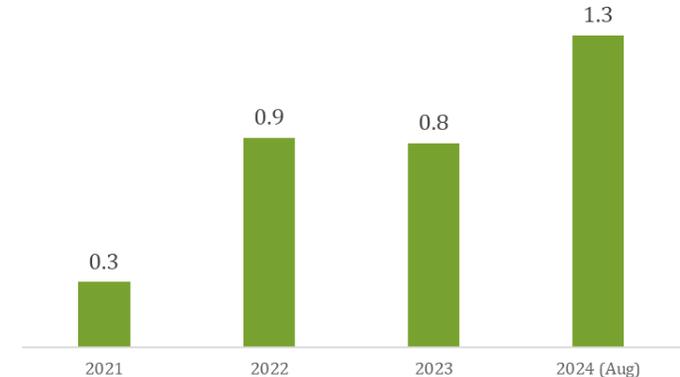
CB availability was catalyst for participants to committing to DLT-transactions

- For some market participants, CB settlement is key element in (issuance) decision



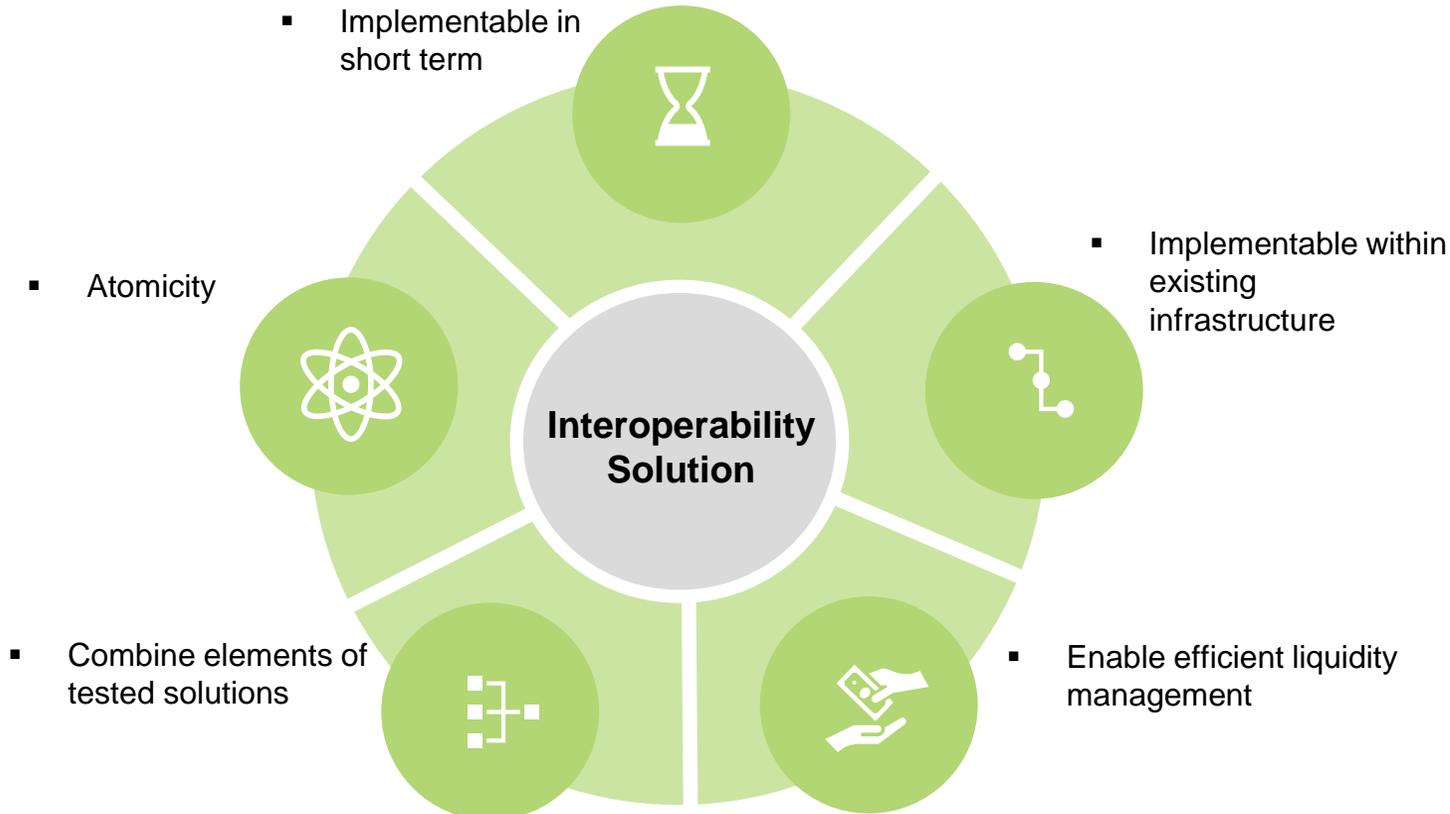
Collateral eligibility another key to fully unlocking market interest

- Eligibility DLT-based securities for collateral in monetary policy operations key for secondary market development



ECB can help maintain momentum by implementing a solution and adjusting collateral framework in the short term

Key Elements



Benefits short-term solution

- ✓ Enables continued momentum
- ✓ Helps prevent cash-leg fragmentation
- ✓ Can service developing ecosystem

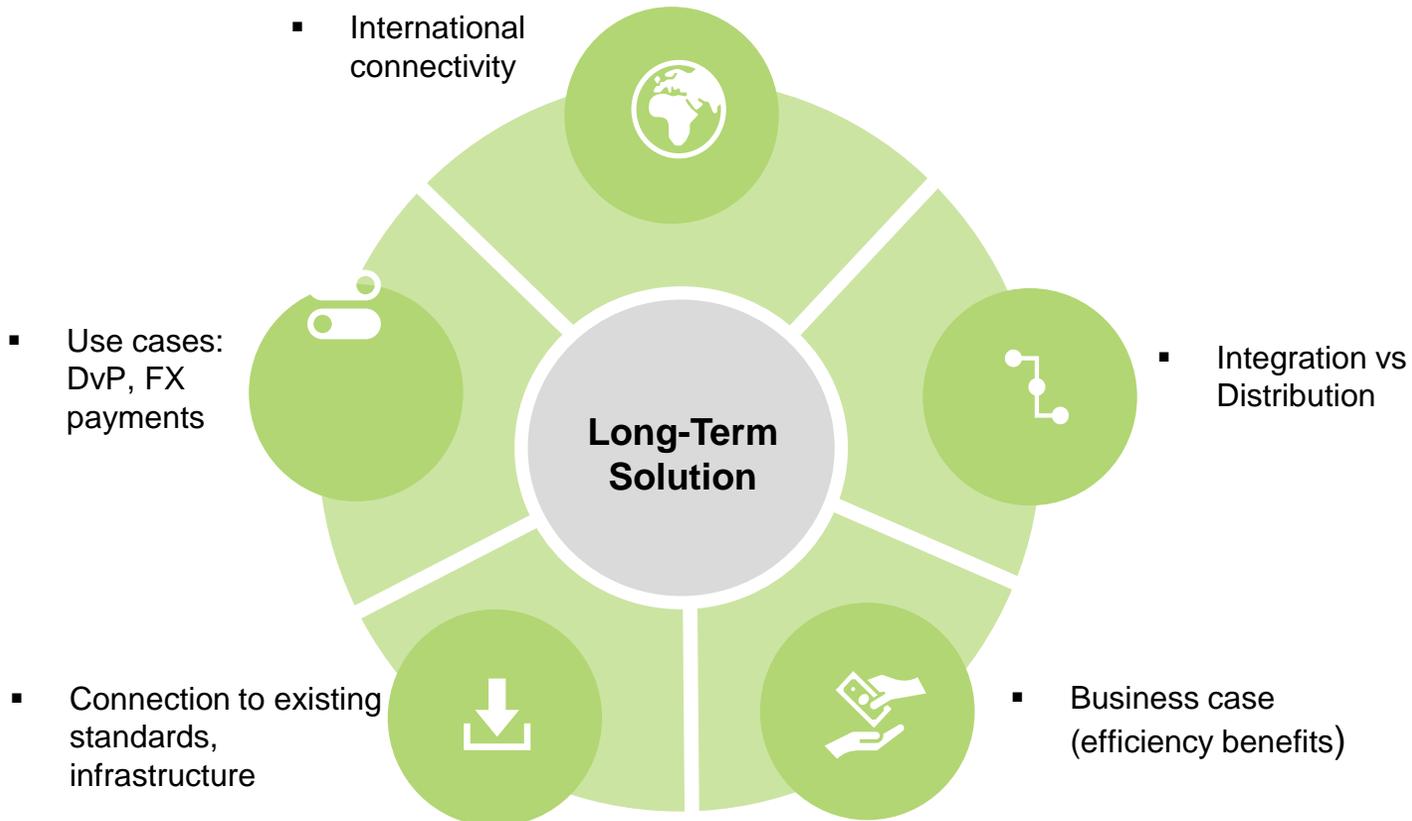
Collateral

- Combine cash solution with clarification collateral treatment DLT-based securities
- ECB can enable DLT PR securities as marketable assets for collateral



A short-term solution can be combined with a commitment and roadmap towards a longer-term wCBDC solution

Key Considerations



Next Steps

- Currently too early to foresee outline of long-term solution.
- Next steps:
 - Monitor market developments,
 - Structured dialogue with market participants

Points to consider

- Key points in designing a long-term solution:
 - How to ensure volume by enabling: efficiency benefits to market participants, What use cases to include (DvP, PvP)
 - How to ensure international connectivity

Fragmentation

- A long-term solution can co-exist with an interoperability solution.



AFME will continue to support scaling of DLT-based capital markets

Roadmaps for Issuance & Policy



CLIFFORD
CHANCE



Scaling DLT-Based SSA and Government Bond Markets

A Roadmap Strategy for European Issuers
June 2024



Association for Financial Markets in Europe
www.afme.eu

Scaling DLT-based Capital Markets

A Policy Roadmap for the EU
August 2024



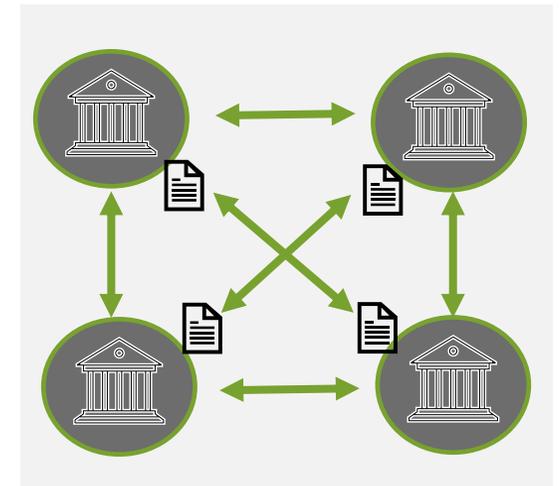
Association for Financial Markets in Europe
www.afme.eu

Standards



Fixed Income
Fixed Income Framework
NOVEMBER 2024

Ecosystem Development



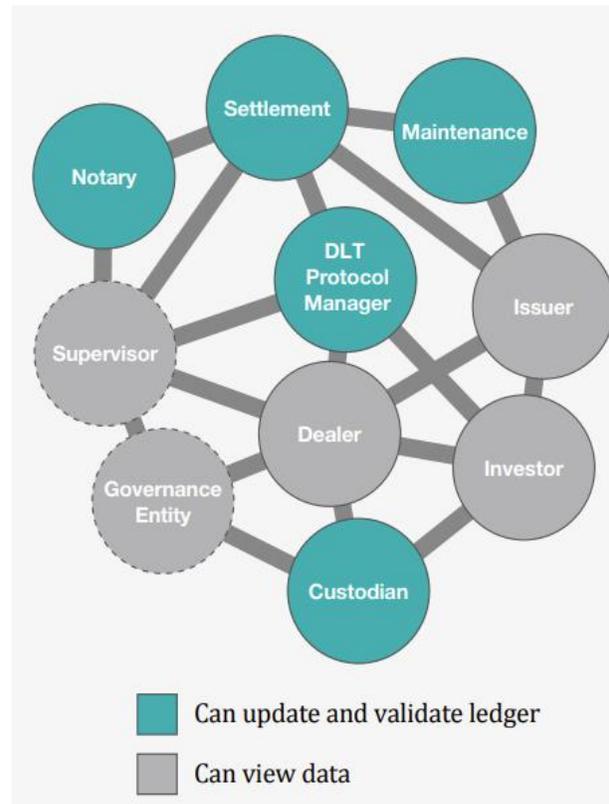
AFME has proposed a series of legislative changes to enable scaling of cooperative, DLT-based settlement systems

Required legislative changes

- Enable regulation of individual services within a settlement system (based on PFMI principles)
- Enable individual functions to be performed by regulated entities
- Legislate for new roles in a distributed settlement system

Benefits

- ✓ Enable network-based, cooperative, distributed settlement systems
- ✓ Enable reduction in fragmentation (walled gardens).



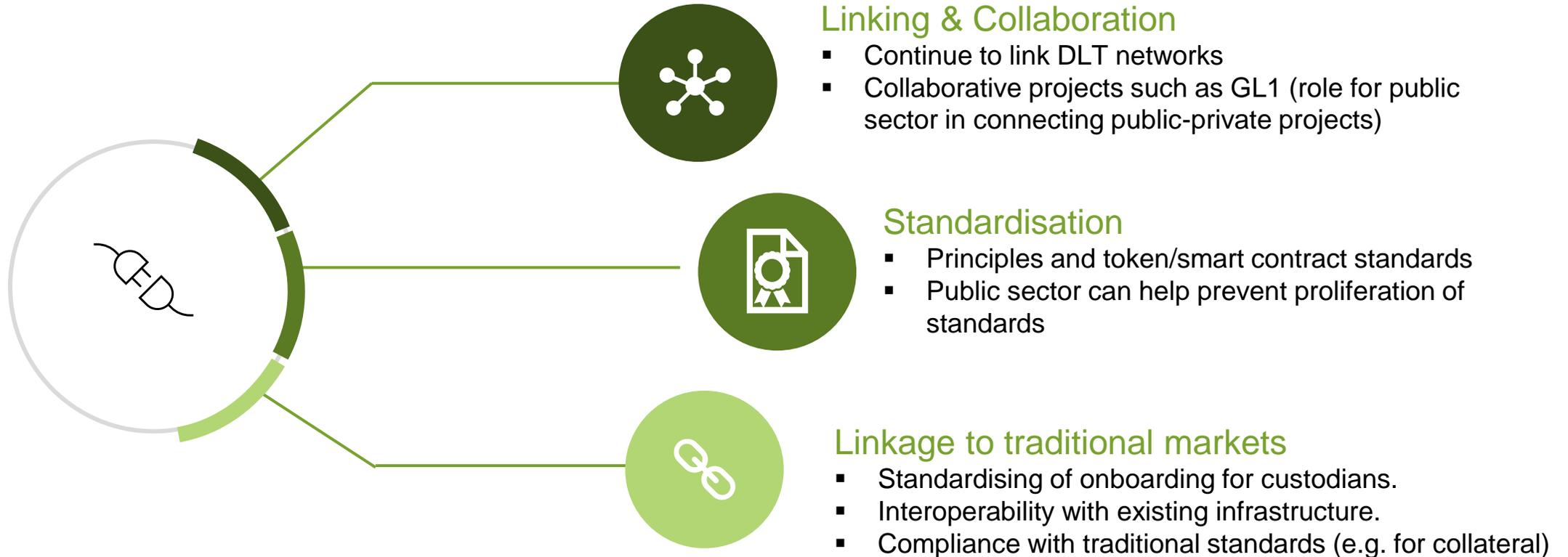
Service	Centralised (Current)	Distributed (DLT-based)
Notary	Recording of securities	Creation of tokens
Account maintenance	Maintaining top-tier securities accounts	Updating ledger (need not be centralised)
Settlement services	Updating securities accounts	Validating on-chain transactions

Service	Distributed (DLT-based)
Protocol management	Maintenance and enforcement of DLT governance protocol (incl control over smart contracts)
Governance	<ul style="list-style-type: none"> • Oversight over network participants. • Coordinate network-wide actions (e.g. resilience testing)

For further details on the proposals, see:

- [AFME \(2024\) Scaling DLT-based Capital Markets – A Policy Roadmap for the EU](#)
- [AFME \(2024\) Use of DLT and Tokenisation in Financial Markets – A Proposed Vision and Recommendations](#)

Ongoing linkages and standardisation of DLT-based networks will be key to scaling



KEEPING MOMENTUM

Presentation to ECB NTW-CG

BNP Paribas

November 2024



BNP PARIBAS

The bank for a changing world



Table of contents

1 **KEEPING MOMENTUM : BNPP COMMITTED TO ACCOMPANY TOKENIZED FINANCE**

2 **TOWARDS A COOPERATIVE SYSTEM**

3 **REQUIRED REGULATORY REFORMS**



Keeping Momentum: BNP Paribas is committed to contribute to European-led wholesale central bank digital settlement solutions to accompany the growth of tokenized finance

It is our conviction that wholesale digital settlement solutions in Central Bank money prevent monetary fragmentation, safeguard the singleness of money and offer a unique combination of liquidity and safety which is why we are eager to participate in their development



BNP Paribas' proposal to continue collaborating with the Eurosystem via Digital bond issuances and tokenized commercial bank deposits exploration

BNP Paribas is committed to play an active role in building the best solution with wholesale digital payment solutions for Central Bank money and digital commercial bank money to preserve **monetary policy transmission and to safeguard the anchoring of wholesale Central Bank money in financial markets**



Wholesale Central Bank digital settlement solutions are **required to capture the benefits of tokenized markets** of risk reduction & operational efficiency, improved transparency and enhanced business opportunities



As a top-tier international banking establishment and a European leader operating in four domestic markets (France, Italy, Belgium & Luxembourg), BNP Paribas advocates for **European-led wholesale digital settlement solutions to preserve European Sovereignty**



BNP Paribas's contribution to wholesale Central Bank digital settlement solutions

BNP Paribas has developed **two digital platforms** (NeoBonds & AssetFoundry) and **invested in networks** with the capacity to work on different DLT architectures in both public and private environments with a comprehensive and agnostic approach. **We actively participate in many wholesale Digital projects in Central Bank money**



Keeping Momentum: Specific zoom on Digital Cash

Anchoring monetary policy in a digital world

- A non-coordinated multiplication of digital solutions, including those utilizing stablecoins, could lead to **fragmented markets and pose a threat to financial stability**
- **Wholesale settlement solutions provided by the central bank help to avoid such fragmentation**
- Tokenised commercial bank deposits are **preferred over stablecoins** to preserve financial stability and the singleness of money

Solution to allow wholesale digital markets to develop

- We observe **rising client interest for tokenized asset** as their benefits in term of efficiency, safety and accessibility become more widely recognized
- Wholesale Central Bank Money Settlement would be a **key enablers to Digital assets development**
- **Providing such readily available and pragmatic solutions** would bring visibility and **act as a key enabler**
- **Trials in ECB exploratory work have shown that interoperability solutions are a pragmatic step towards a cash leg for the settlement of digital assets**
- **BNPP is eager to contribute to put one or more interoperability solutions in production**

Two-tier model

- We believe that access to wholesale digital settlement solutions should be **restricted to existing members of T2/ T2S**
- This two-tier model preserves the **equilibrium between central bank and commercial bank money**
- The two-tier model would leave space for **commercial banks to develop services to their clients**, such as tokenized commercial bank deposits



Keeping Momentum: BNP Paribas committed to continue trials with Eurosystem and to prepare for the future

BNP Paribas is committed to contribute to the construction of Eurosystem-led wholesale digital settlement solutions.
BNP Paribas would like to volunteer for additional experiments beyond November 2024

DvP

- BNP Paribas is ready to find the **most appropriate solution for digital asset markets**, that is the most cost efficient and the less risky for ECB and the market
- BNP Paribas is ready to contribute to the commercial and reputational success of the solution(s) chosen by ECB through a **digital bond program to be issued by either BNP Paribas or by external clients**
- BNP Paribas is ready to find solutions to **limit market fragmentation**

PvP

- BNP Paribas **participates in AGORA project** and suggests **exploring the optimal infrastructure for tokenized commercial bank deposits** and their settlement with Central Bank Money
- BNP Paribas would like to evaluate together the **potential impact of alternative solutions in light of the increasing prominence of stablecoins**
- BNP Paribas would like to explore together **further use cases** enabled by wholesale digital settlement solutions and tokenized commercial bank deposits (e.g. FX)

Incremental approach

- We recommend an **incremental approach**, adapting the solution as market evolves
- Allowing to **develop over time** the most appropriate solutions as digital assets markets are still at an early stage of their development
- Allowing to **reduce risk and cost**, as it is not clear today which digital assets markets will start first



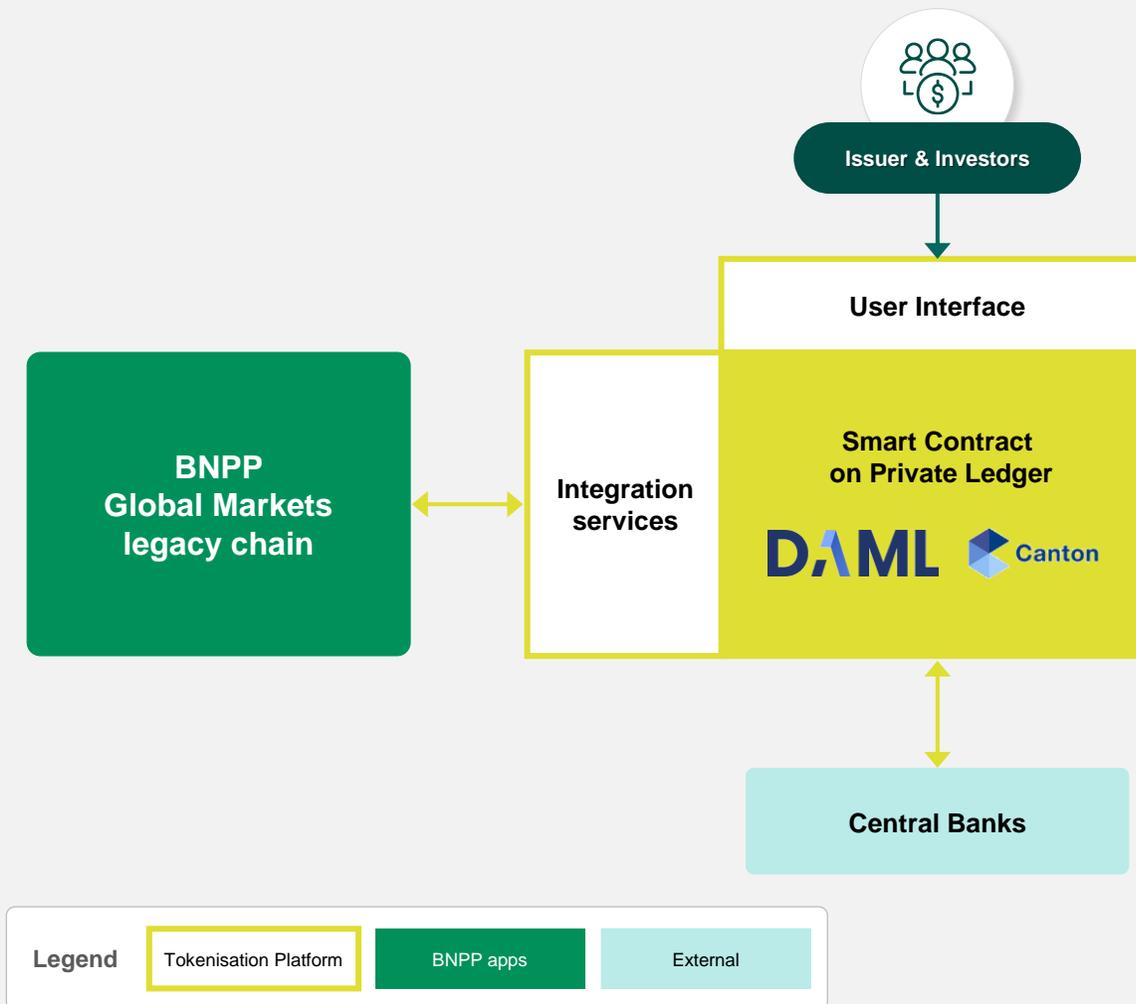
Towards a cooperative system: Neobonds, live and Integrated Tokenisation Platform



Neobonds is BNPP's Global Markets Tokenisation platform, integrated into BNPP CIB infrastructure.

Neobonds supports **Bond Issuance and lifecycle events** (coupons, secondary trading, etc...) over the duration of the Bond.

3 Digital Bonds issued and distributed as part of the ECB Experimentation programme including the **1st Eurozone/EMEA Sovereign Digital Bond for Slovenia**



Towards a cooperative system: Neobonds part of the Canton Ecosystem



A group of +20 applications are using Canton including Dealers, FMIs, Execution platforms/exchange

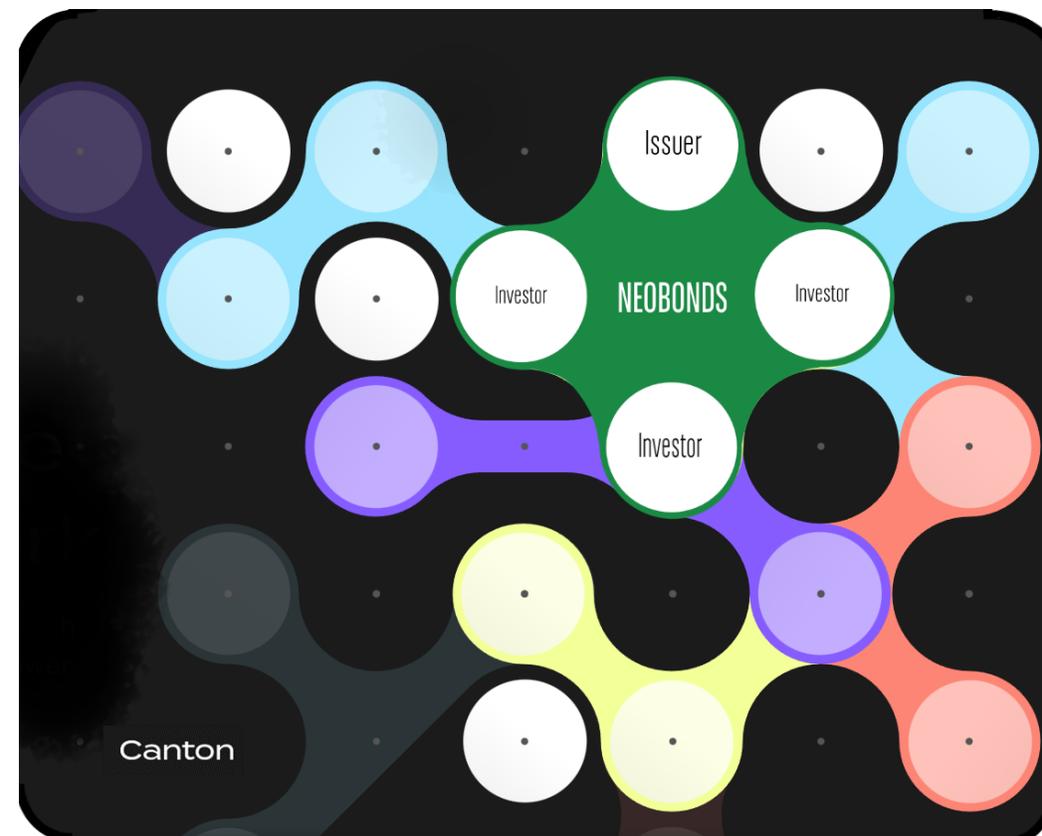
A library of financial products on Smart contract format to be used across applications.

A private network with an optional public access :

- **via private connection** between applications (i.e. transaction details are kept fully private)

OR

- **via public infrastructure**, where transacting applications are disclosed but transaction details only accessible, on a need-to-know basis



* Canton Network is the industry's first privacy-enabled interoperable blockchain network. It will provide a decentralized infrastructure that connects independent applications built with Daml, Digital Asset's smart-contract language.



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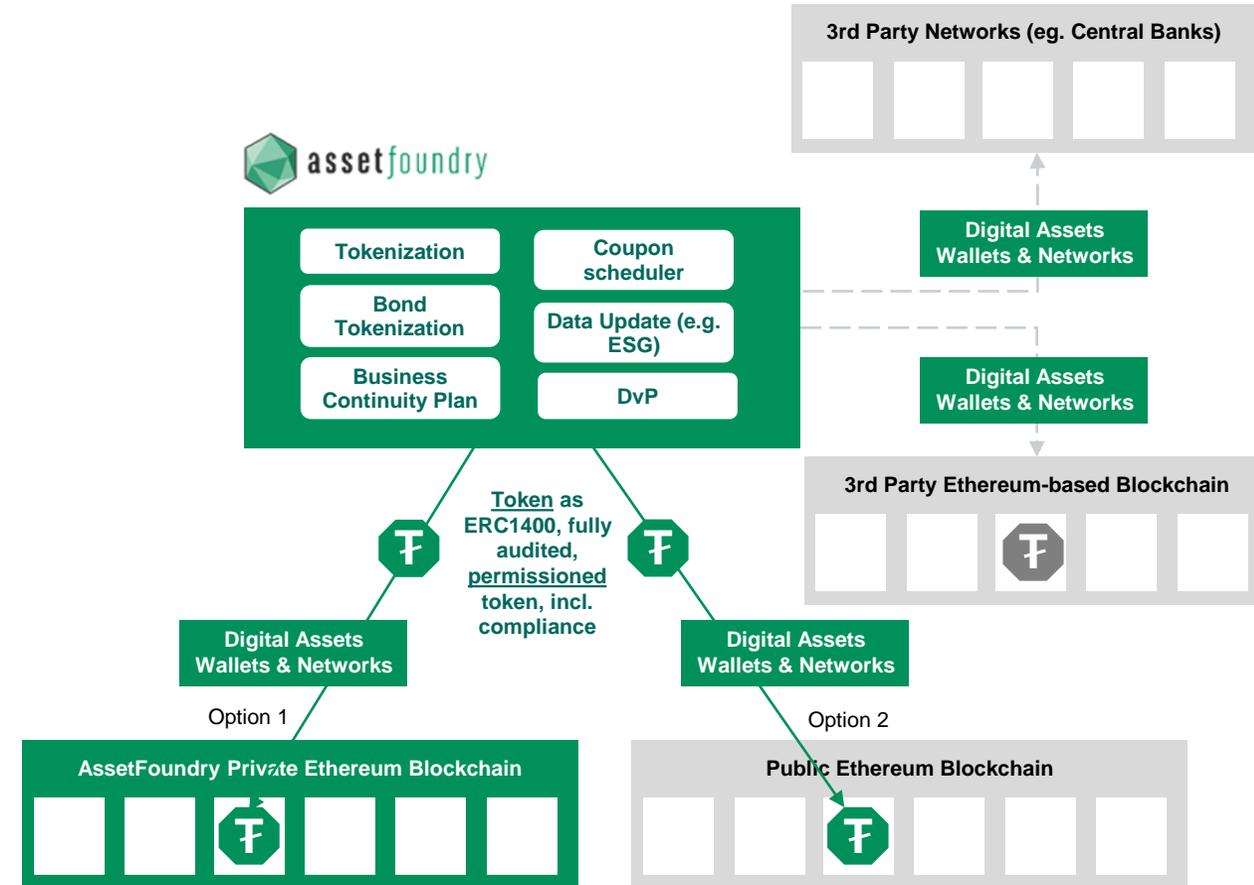
Towards a cooperative system: *AssetFoundry*, leveraging Ethereum

With regards to tokenization and associated network effects (i.e. a token representing a financial instrument, which can freely move across the overall financial ecosystem via a shared network), **Ethereum (EVM-based) is one of the widely used technologies**, both in private and public setups.

By using the same infrastructure technologies, and same standards (eg ERC20/ERC1400), this leads to **improved compatibility and time-to-market to connect EVM-based networks between themselves**, while allowing each participants to build its own offering.

BNP Paribas has developed *AssetFoundry* tokenization platform:

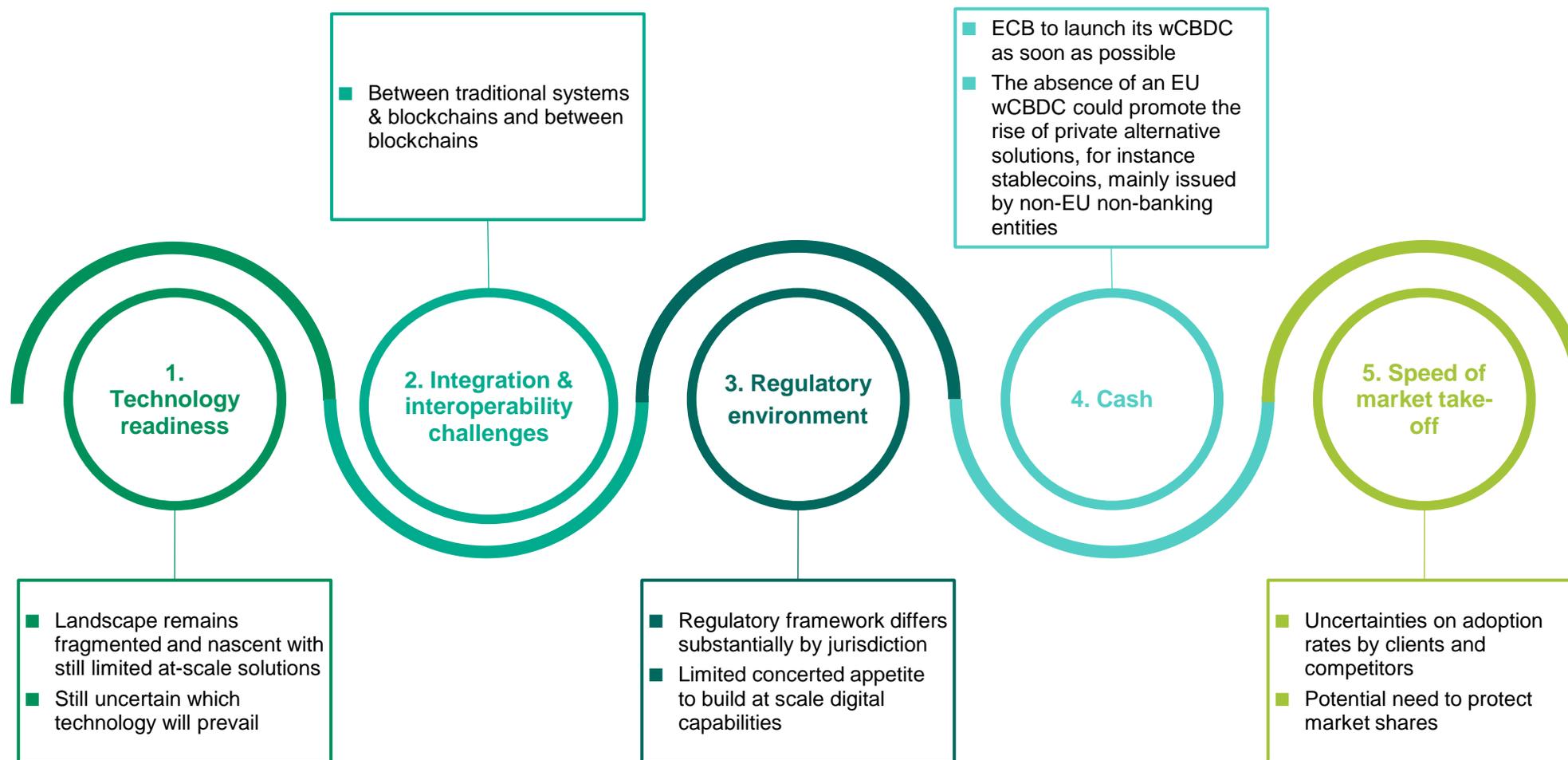
- Based on a **Ethereum technology**, either public or private, hence ensuring high resiliency for future EVM-based networks with the ability to seamlessly switch between private and public networks to follow market demand
- *AssetFoundry* is based on **permissioned, fully audited ERC20/ERC1400 tokens** (incl. compliance, business continuity plan) as well as **obfuscation and privacy management** incl. on public networks
- **Compatible with any EVM-based networks** on the market (e.g. JP Morgan, Citi, AllFunds, Fnality, Partior etc), ensuring faster time-to-market regarding development and connectivity
- *AssetFoundry* was **tested in July 2022** with live trade for project finance with EDF
- Supports additional **data management in the token, eg ESG data**, with cryptographic update directly in the token (incl. multi-signature) to ensure data is always fresh and trustable
- Additionally, *AssetFoundry* team also provides **blockchain connectivity and wallet management capabilities to BNP Paribas** via a dedicated technical component called “Digital Assets Wallets & Networks” (DAWN), for a single and simple access to multiple networks



Components shown in green are BNPP proprietary technologies



Strong challenges ahead however to see the uptake of tokenisation in financial markets



These external drivers are strongly intertwined : uptake will require an iterative approach in the coming years



What regulatory reforms are required for tokenisation to occur ?

Short term

- DLT Pilot Regime quick fix to make it more attractive
- Financial and Central Bank Collateral Eligibility

Medium/long term Permanent changes

- Review of the Central Securities Depository Regulation (CSDR)
- Review of the Settlement Finality Directive (SFD)
- Review of the Financial Collateral Directive
- Ensure, when transposing into the EU the standard adopted by the BCBS in December 2022, beyond the transitional regime already integrated into the CRR, that tokenised traditional assets (securities, bank deposits, etc.) are not penalized from a prudential perspective compared to their non-tokenised traditional equivalents, notably in terms of LCR, NSFR and HQLA eligibility



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ECB – NTW-CG

On-chain correspondent banking using wCBDC for settlement

a validated open-source protocol

NOVEMBER 2024



Contact: Guérolé de Cadoudal
digitalassetsgroup@ca-cib.com

DISCLAIMER

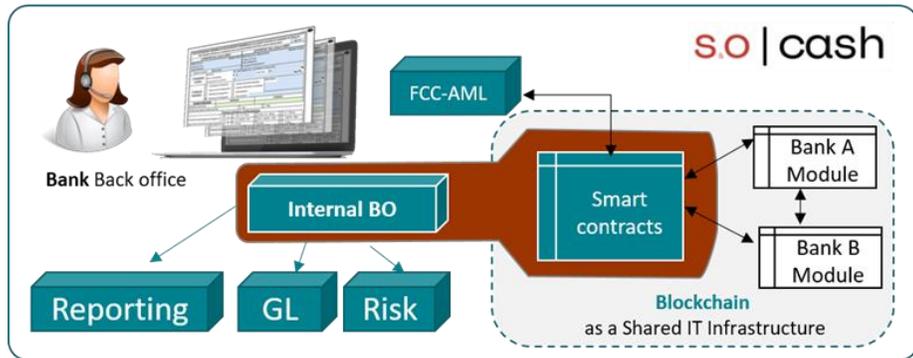
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- 1 Successful experimentation of s.o | cash model
- 2 An open banking ecosystem
- 3 The actions to take it forward

1. s.o | cash successfully implemented and tested with wCBDC

s.o | cash protocol takes the best of stablecoins and tokenized deposits in a form of on-chain correspondent banking running inside a shared decentralized multi-purpose ledger



Demonstrated functionalities

- **Instant atomic transfer** between client's bank accounts across different banks
- **Programmability of treasury requirements** for both banks and clients.
- **Safe and automated wCBDC settlement** without the need for a centralized platform using HTLC
- **Direct and instant access to account** (for clients and banks) without going through the off-chain bank IT system providing a homogeneous TMS.
- **Atomic clearing** of respective cash liabilities without CeBM
- **Online payments** without card or PSP
- **Payment composability** in wider functional scenarios using smart contracts (subscription validation, invoice payments, DvP ...)
- **Legal validity** is achievable

A collaboration with

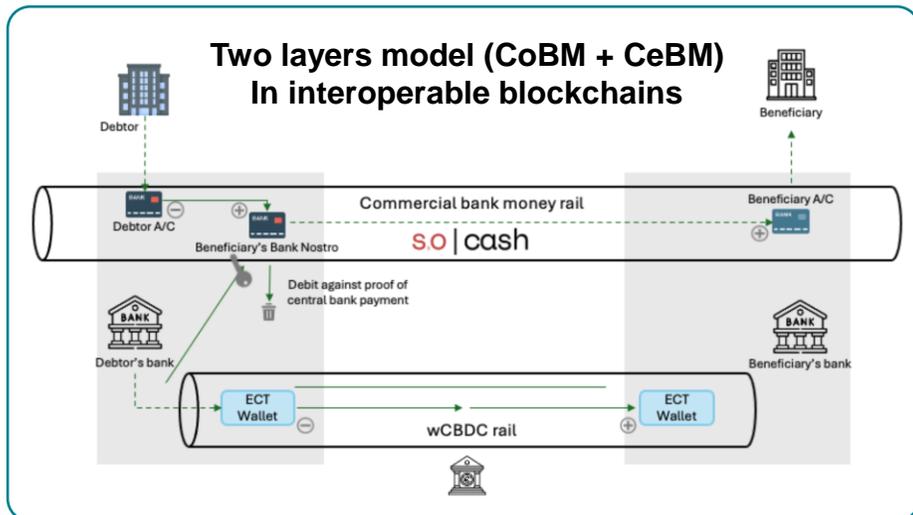


caceis
INVESTOR SERVICES

WHITE & CASE



and several European
observer banks and FMIs
providing feedbacks



2. Practical challenges faced during the experimentation

Challenges

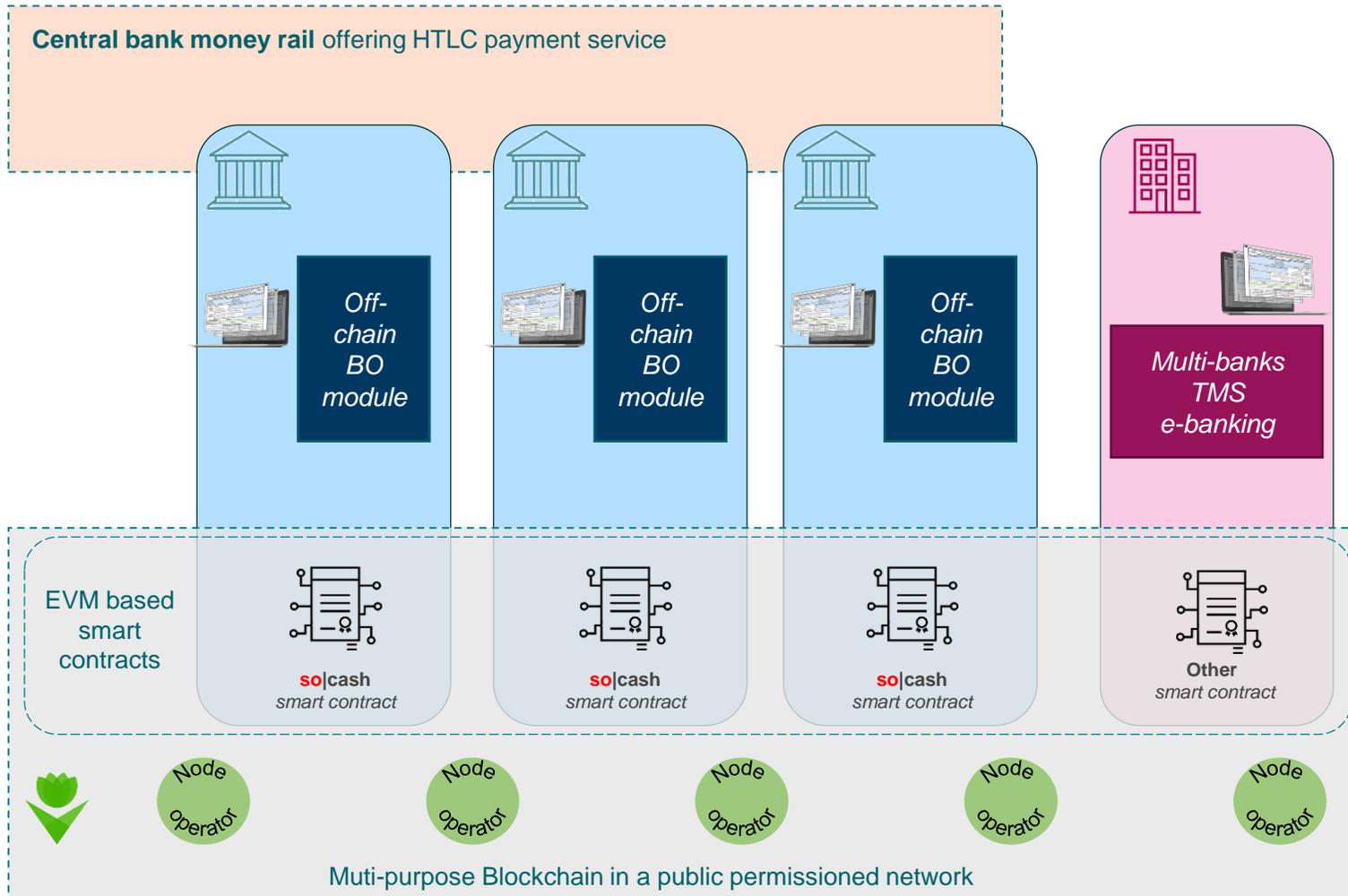
- **Build a collective of interests in the experimentations:** Most of the banks and institutions were prioritizing their own experimentations or planned international project leading to a lack of capacity for direct involvement in the experimentation
- **Collective governance and confidentiality:** To ensure that all participants were correctly committed to contribute to the project success and the communication some formalisation were necessary
- **Selecting the technological stack** for implementing a blockchain protocol could have been challenging
- **Interoperability with DL3S** was involving quite some deep understanding of the protocol and the way to make it possible without a central orchestrator
- **Legal validity** was not critical in an experimentation, but we deemed beneficial to query the validity of the model

How did we address it / solve it ?

- **Focus the experimentation with available capacity** and invite participants with less capacity to **acts as observers** during the experimentation and provide feedbacks on the results allowing the core team to have **more collective inputs** than otherwise
- **Align actual interests:** The genuine understanding of all actors' interests was needed to secure deliverables
- **Small contracts and NDA** to formalize understanding and each participants obligations because of the experimental and in-fine open sourcing of the work
- **CACIB** experience in the blockchain domain **has provided all necessary building blocks** (EVM network, blockchain middleware, Wallet management), and smart contract expertise. Some work remain though
- **The collaboration with BdF** technical team has been instrumental to gather all necessary information. **Testing** has been **initiated at an early stage** of the process to stabilize the orchestrator.
- **White & Case** (Paris office) has been providing an analysis confirming the validity of the principle of so|cash model and identifying the legal framework that should be put in place for the correspondent bank relationship and the account opening contracts.

3. An open banking ecosystem based on a multi-purpose blockchain

so|cash protocol provides a multi-currency platform free correspondent banking ecosystem where all actors remain free to join, make partnership, choose their tech providers, innovate autonomously with new services, set their own pricing ... The protocol is now open-sourced, so no licencing is required to start using it.



- **Central bank money** is available to banks via interoperability (*until they can be made available on-chain*) or via alternate approaches
- **Each bank maintains its own infrastructure** with internal IT systems to interface with legacy, CeBM layer and unified ledger
- **Each bank is free** to setup correspondent banking relations
- **Clients can operate on their accounts** directly and mix payment with their own solutions (on-chain or not)
- **Each bank deploys its own so|cash compatible smart contracts** that can talk to each other under a correspondent banking relationship
- **Other smart contracts** can be operated and connected to so|cash compatible accounts
- **Permissioned node operators** securing the transactions via a consensus. Can be any respectable and publicly known company.

4. Challenges and actions to take so|cash forward

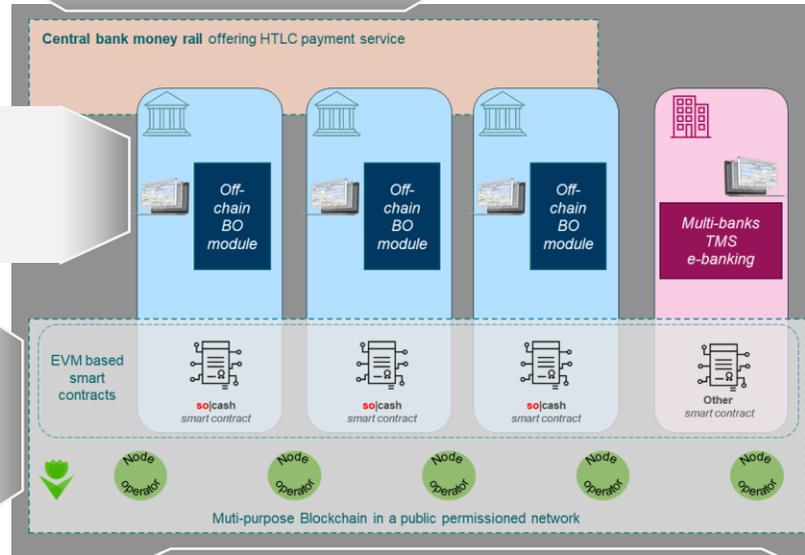
so|cash protocol needs to mature via an industry wide workgroup and by being incorporated as a brick in existing local and international projects

- Integrate with **additional interbank settlement currencies**

- **Integration with existing infrastructure** (SWIFT, Legacy ...)
- On the shelf software to reduce the bank time-to-market

- Real **bank independence** with multiple **so|cash compatible implementations**

- **so|cash protocol** need a transversal correspondent bank SSI referential

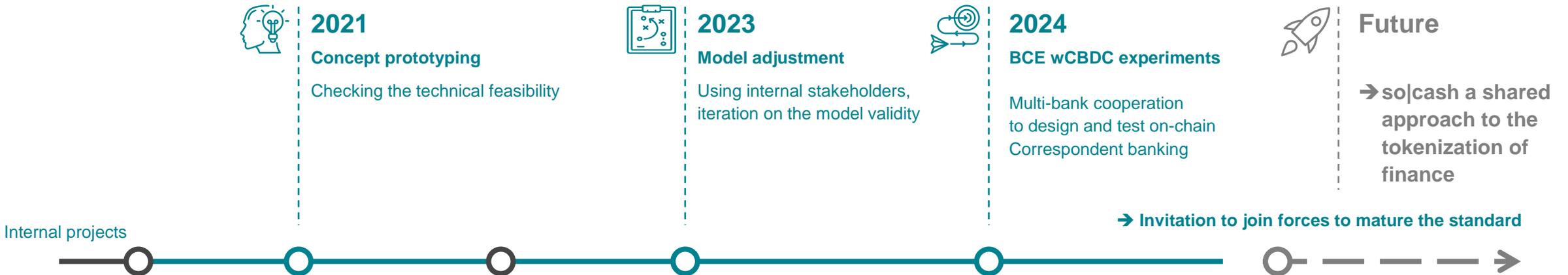


- **TMS suppliers** should construct **so|cash compatible** account management solution

- **so|cash protocol** should **evolve** to
 - Enable multiple banks intermediary in the payment
 - Enable fully atomic interbank settlement with "distributed" CeBM or stablecoins
 - Enable interbank flows between multiple chains
 - Improve ISO 20022 compatibility

- **Permissioned distributed governance** of blockchain remains a challenge so the operators can be supervised, and the infrastructure timestamp be recognized for payment finality
- Public blockchain do **not respect well privacy**. Work is necessary to implement Fully Homomorphic Encryption (for instance)

Appendix: The history and status of so|cash model



Internal projects

Public projects

2021
Concept prototyping
 Checking the technical feasibility

2023
Model adjustment
 Using internal stakeholders,
 iteration on the model validity

2024
BCE wCBDC experiments
 Multi-bank cooperation
 to design and test on-chain
 Correspondent banking

Future
 → so|cash a shared
 approach to the
 tokenization of
 finance

→ Invitation to join forces to mature the standard

Since 2021
Project mBridge aims to create
 a multi-CBDC platform for
 instant, low-cost cross-border
 payments using blockchain
 technology
Project Jura focus on exploring
 cross-border settlement using
 wholesale CBDCs for the euro
 and Swiss franc

2022
Project Mariana aims to explore
 the potential of decentralized
 finance (DeFi) for interbank
 foreign exchange markets

October 2023
Digital Euro
 The ECB entered the preparation
 phase for a digital euro focusing on
 finalizing the rulebook, selecting
 infrastructure providers, and extensive
 testing. This phase is crucial for setting
 up a robust framework for the digital
 euro, which aims to offer instant
 settlements and high privacy levels

2025
Project Agorá aims to
 explore the benefits of
 tokenization in enhancing the
 functionality and efficiency of
 the global monetary system,
 particularly through cross-
 border payments





Digital Transformation of Financial Markets

ECB NTW Contact Group

26 November 2024



DEUTSCHE BÖRSE
GROUP

Digital transformation of financial markets resembles historic industry evolutions

	Mobility	Music	Photography	Finance
Manual				
Electronic				
Digital				

Technology will help to shift certain areas into digital era

Digital and decentral technology with potential ...

- ▶ Securities as smart digital objects
- ▶ Digital securities as “golden source” of truth to a broad range of market participants
- ▶ Infrastructure cost savings through shared infrastructure
- ▶ Transparent data sets and audit trail
- ▶ New products through combination of TradFi and DeFi



Data consistency

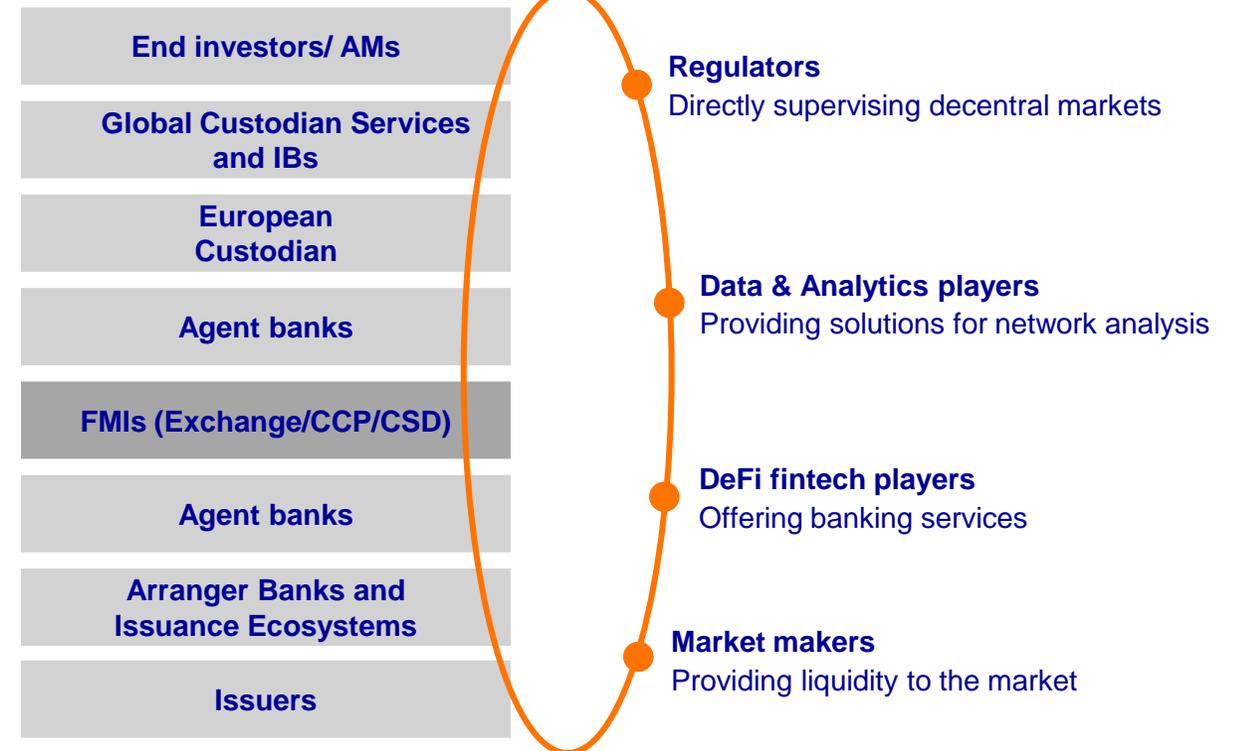


Audit trail



Smart objects

... to transform today's value chain



Regulatory framework provides increasing legal clarity to foster digital transformation

Germany

- The Electronic Securities Act, **eWpG**, was passed in 2021. The law lists two types of registers being central and crypto-securities registers and allows the issuance of bearer bonds and shares in funds electronically
- The eWpG became more detailed by the accompanying regulation (**eWpRV**)
- **KryptoFAV**, the regulation on crypto fund units, entered into force 2022 opening further opportunities
- The eWpG has been amended by the Zukunftsfinanzierungsgesetz (**ZuFinG**) to include shares
- Finanzmarktdigitalisierungsgesetz (**FinMaDiG**) will introduce **MiCA** in the German context and change certain provisions on the Kreditwesengesetz (**KWG**)

Lux

- Since 2021, the “**Blockchain Act II**” enables the issuance of dematerialised securities directly in “securities issuance accounts”. This account may be carried out within or through secured electronic registration mechanisms, including DLT

EU

- With the **Digital Finance Package**, the European Commission initiated the digital transformation of the financial sector in 2021 by proposing (among others) the following legislations
 - **MiCA**, which entered into force in June 2023 and is partly applicable in June 2024, is the key regulation on crypto-assets and asset-referenced tokens, which are not MiFID II financial instruments
 - **DLT pilot regime for market infrastructures** entered into force in March 2023, and allows market infrastructures to experiment with DLT. It also amended the definition of MiFID II financial instruments by clarifying those that are issued by means of DLT
- The Eurosystem launched the **Digital Euro project in 2021**, focusing first on retail payment and increasingly on the wholesale area
- **ECB launched “ECB trials and experiments”** together with three national central banks to explore potential solutions for digital wholesale payments

D7 is providing institutional-grade digital financial market infrastructure

Our digital ecosystem ...



Jointly developed with
 Google Cloud

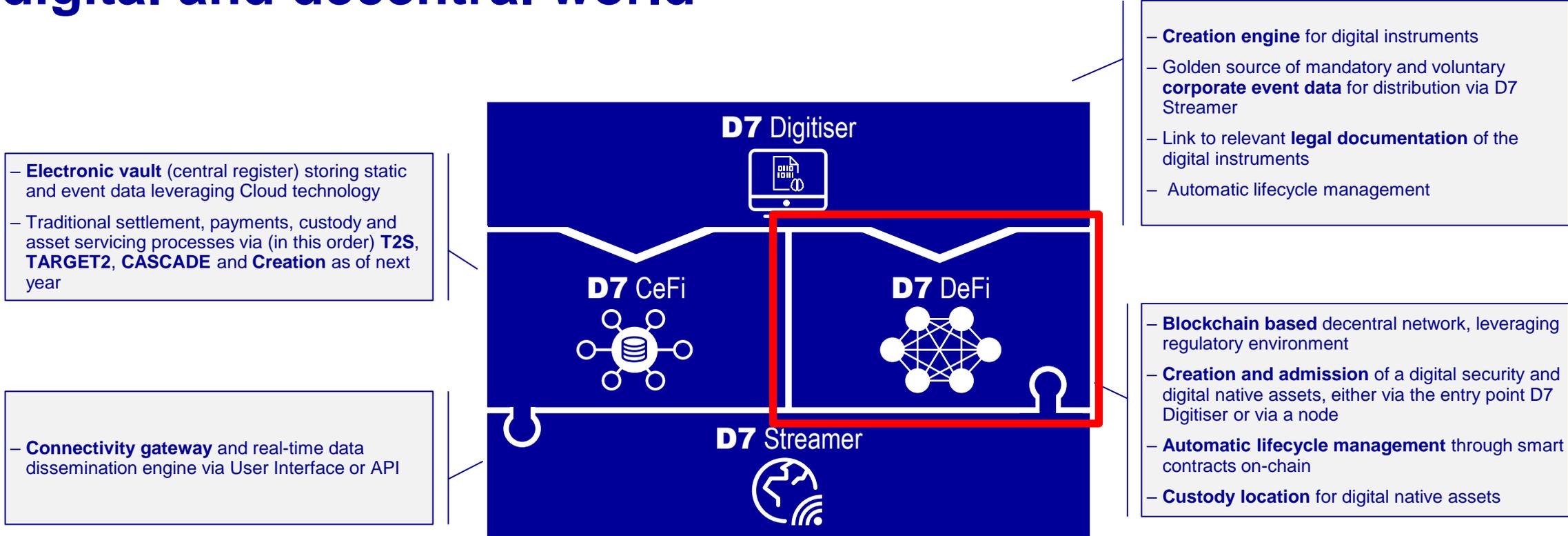
... translating into D7 mission statement

Next-generation digital platform, allowing market participants to issue electronic securities by leveraging digital instruments, a digital description of the securities

D7 provides a **fully digital alternative** to conventional physical issuance and processing of securities. Customers will be able to digitise their financial products with continuing access to both existing **central and distributed infrastructures and markets**

In the future, market participants benefit from **same-day-issuance** and **automated straight-through processing** for the entire value chain of issuance, custody, settlement and asset servicing for electronic securities

D7 product family addressing market needs for traditional, digital and decentral world

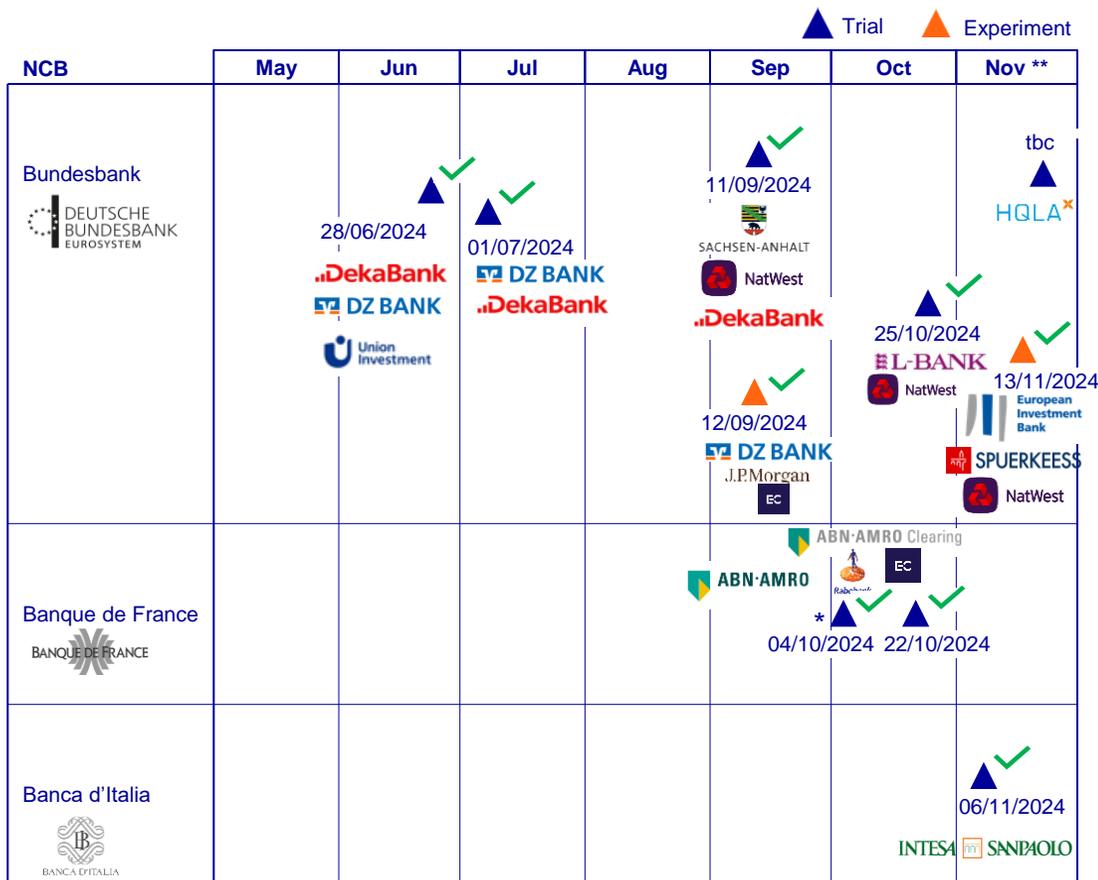


D7 DeFi i.e. the usage of DLT and decentral services is core part of the D7 service suite – new products and services are part of the envisaged 2025 roadmap and beyond

ECB Trials – Overview of Clearstream/DBG use cases

Use cases ranging from issuance, collateral management to securities financing

Use-case execution Roadmap



*Issuance on 4th, repo transactions on 22nd

** On top, all bond redemptions were processed in November

Achievements so far ✓

- ✓ Successful issuances with domestic and international players
- ✓ Proving robustness of D7 DLT with well-functioning workflows across issuance, primary distribution and redemption
- ✓ Successful connectivity with all three National Central Banks (Bundesbank, Banque de France, Banca d'Italia) ensuring seamless exchange of cash and securities
- ✓ Connected CCP and 3 CSDs : ECAG, CBF, CBL and LuxCSD; local issuance (DE und LU) as well as international issuance (XS ISIN)
- ✓ 7 Commercial paper issuances and 10 use cases in total
- ✓ Novel use cases: first centrally cleared intraday repos (JPM/DZ followed by ABN AMRO/ABN AMRO Clearing/Rabobank)

Next up.. ⌚

Keep the momentum of the ECB Trials and work jointly towards a 'transitory solution'

Eurex Clearing's Participation in ECB Exploratory Work

Exploring the Potential of Distributed Ledger Technology (DLT)

Wave 1

Use Case: Intraday Cleared Repo

- Intraday special repo transaction of a native digital commercial paper issued by DekaBank
- Participating clearing members: JP Morgan and DZ Bank
- Trading on Eurex Repo's F7 platform
- DvP over Clearstream Frankfurt's D7 platform
- Cash settlement via the Trigger Solution of Bundesbank
- Experiment execution date: 12 Sep 2024

Wave 2

Use Case I: Intraday and Overnight Cleared Repo

- Intraday and overnight repo transactions of a native digital commercial paper issued by ABN Amro Bank
- Participating clearing members: ABN Amro Bank, ABN Amro Clearing, Rabobank
- Trading on Eurex Repo's F7 platform
- DvP over Clearstream Luxembourg's D7 platform
- Cash settlement via the Banque de France's Full Interoperability DL3S Solution
- Trial execution date: 22-23 Oct 2024

Use Case II: Margin Call

- Margin call provision by ABN Amro Clearing over the ledger of BdF/DL3S
- Trial execution date: 22 Oct 2024

Eurex Clearing served as a Central Counterparty (CCP), upholding market integrity through the application of risk methodologies that comply with regulatory standards

Eurex Clearing - Major Highlights

Counterparty Credit Risk

- Remains unchanged irrespective of the underlying technology.

Operational Insights

- Demonstrated seamless integration of conventional and digital/DLT flows through the CCP.

Interoperability

- Highlighted the importance of interoperability between DLT platforms and traditional finance systems.

Wholesale CBDC

- Emphasized that the implementation of wholesale CBDC is crucial for the digital transformation of the financial industry in Europe.

Market Integrity and Safety

- Confirmed that CCPs play a vital role in digital eco-systems, ensuring the stability and efficiency of the broader financial ecosystem.

ECB-Trials – What’s next?

Recap on the initiative



- The ECB trials initiative has been **recognized as a crucial milestone** in the European journey towards a digital wholesale Euro
- Results of the ECB trials should serve as the groundwork and **foundation for further developments**
- We should **keep-up the momentum** and allow a seamless transition after the end of the trials

Deutsche Boerse Group as a strong advocate



- The cooperation between DLT operators and market participants was **very efficient in all dimensions of the initiative**
- The implementation of the initiative and **learnings achieved are very satisfying**
- We will **continue our efforts with our CSDs in Luxembourg and Germany as well as our CCP Eurex Clearing**

Proposal: A “Transitory Solution”

- Proceed with **already existing regulatory set-up** facilitated by regulators and authorities (grandfathering)
- Integrate at least one out of the three models **into the ECB`s permanent service catalogue**
- Continue to **grant transactions for already admitted clients** in approved use cases
- **Allow for new use cases and products** based on ECB/NCBs approval - building on trial infrastructure
- **Admit new clients** to transitory solution

From our perspective the continuation of a “transitory solution” would benefit all stakeholders: the ECB, the National Competent Authorities, Market DLT Operators as well as Market Participants/clients

ECB-Trials – What’s next?

Proposal: A “Transitory Solution”

Why?:

- Stopping this process would be **detrimental to the overarching goals of achieving a European digital infrastructure**
- The **present set-up of the trials** with existing infrastructures, connectivity, legal and regulatory framework, participants and use cases **are a suitable and validated foundation for the “transitory solution”**
- The ECB trials already **successfully showcased that market participants would be able to execute transactions under the approved use-cases**, execute new use-cases or combine existing use-cases with new products after approval by central banks in accordance with the current regime’s requirements.

How?:

- The NCB solutions with their connections into the asset chains would **be productive in a limited and controlled environment with the clear knowledge of participants to the Eurosystem.**

Key Features



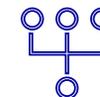
Cater for a variety of use cases



Standardized, scalable, highly available and reliable



Easily accessible



Leverage EUR liquidity pools



Allow for easy adoption by the financial market and real economy

Both, the results of the ECB trials and the experiences from this “transitory solution” would serve as the nucleus for developing a productive long-term solution to stay on the competitive edge in the global competition for digital payments in central bank money.

Conclusions and take-aways

- **Digitization and tokenization are strong market trends.** Besides the asset also the **payment is affected** by this
- **Digital central bank money is strongly desired** for settlement of inter-bank transactions; in its absence the market will make use of **alternative solutions e.g. stable coins.**
- The success of the ECB Trials & Experiments should **become the kick-start to move** on without undue delay
- Under the guidance of the ECB and the supporting local central banks the outstanding questions regarding **interoperability of networks, standardization, fragmentation and governance** should be tackled – in parallel **to establishing a ,transitory solution‘** based on one or more solutions from the Trials
- This should pave the way to a **strategic solution for digital wholesale payments, a Digital CMU and a truly European Unified Ledger**

DBG has already worked since 2016 with central banks on the exploration of DLT technology (e.g. ,Blockbaster‘ project). DBG is a strong contender and contributor to the development of digital market infrastructure with the initiation of the D7 project and the respective deliveries. DBG is fully committed to continue this work – in conjunction with the central banks, the regulators and its clients.

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HSBC Digital Assets and Currencies

Presentation to ECB

November 2024



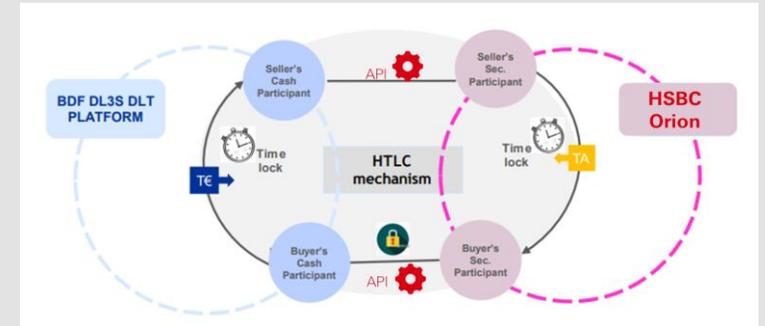
Agenda

- Introductions
- Topic 1: Keeping the momentum after the exploratory work
- Topic 2: Towards a cooperative ecosystem
- Q&A

Keeping the momentum after the exploratory work

Key Learnings from the Eurosystem trials

- Keeping pace with digital innovations in central bank money in European markets.
- Benefits include reduced settlement times and counterparty risks.
- Integration with existing systems and interoperability across different distributed ledgers.



Clear communication regarding the evolution of solutions and overcoming identified challenges will be key.

Wholesale CBDCs and other forms of digital money will continue to drive transformative changes in digital assets space

- Enhance our digital infrastructure and technology capabilities to seamlessly switch between various digital money options according to business needs:
 - Ability to settle using digital money and digital asset on the same ledger
 - Interoperate across ledgers with digital asset and digital money on different ledgers
- Enhance our operational readiness, regulatory alignment, data privacy, and security standards as we continue to integrate wCBDCs and other forms of digital money into existing payment and settlement infrastructures.
- New strategies for cross-border transactions
- Continue to engage in exploratory programs and collaborate with central banks and other financial institutions

Towards a cooperative ecosystem: Project Ensemble

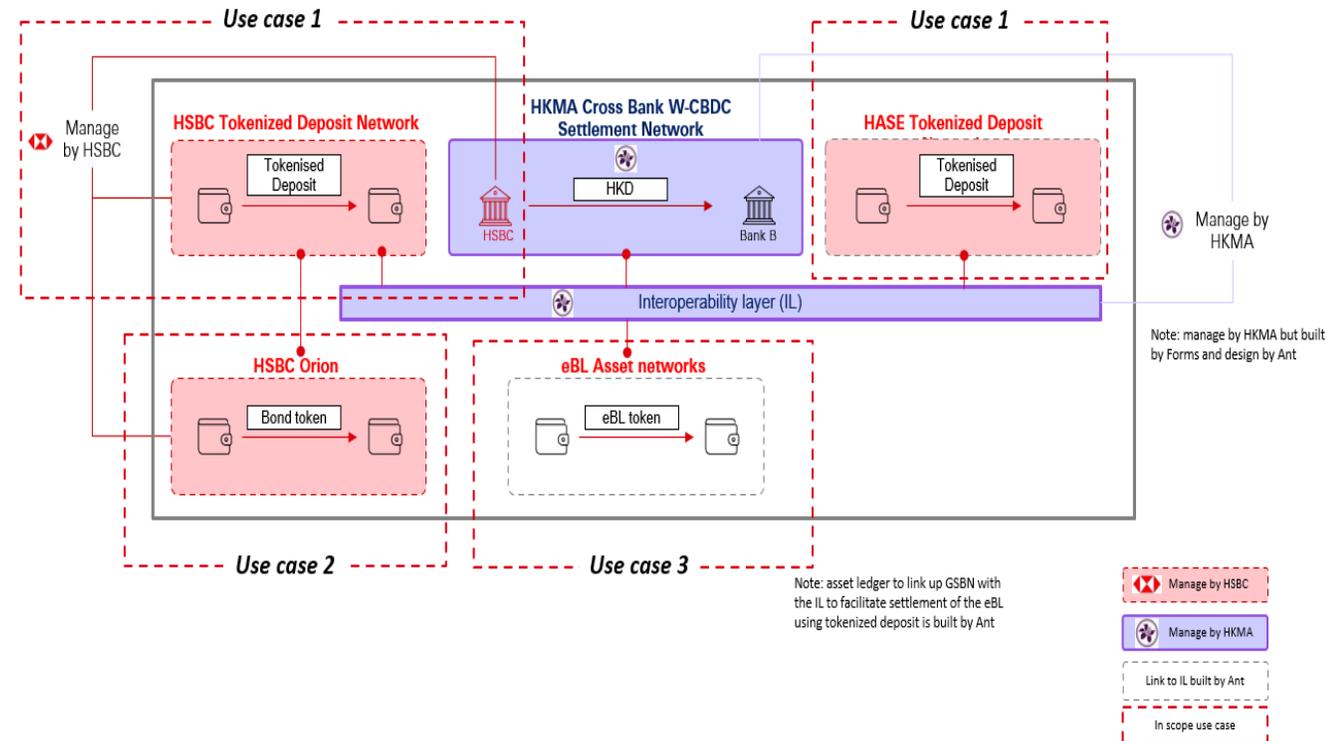


Tokenised Deposit is a developing area relating to tokenisation, generally referring to **the digital representation of bank deposits** where money deposited with a bank is **minted on that institution's own blockchain ledger with the backing of that financial institution's balance sheet.**

- Source from HKMA e-HKD Pilot Programme: Tokenised Deposits



- This project explores a tokenised financial market infrastructure that facilitates interoperability of tokenised commercial bank currencies through wholesale CBDC, supporting atomic Payments vs Payments (PvP) and Delivery vs Payments (DvP) transactions.
- The overall development of the tokenised settlement process, payment message standards, technical interoperability requirements, as well as commercial use case scenarios in Project Ensemble. HSBC has completed three use cases in the initial phase of Project Ensemble:
 - In Use Case 1, we demonstrated the purchase of digital bonds issued on HSBC Orion using tokenised deposits recorded on HSBC's ledger
 - In Use Case 2, we tested Interbank transfer of tokenised deposits between HSBC and Hang Seng Bank (Part of HSBC Group) via Project Ensemble's interoperability platform
 - In Use Case 3, we have tested how to use the Ensemble infrastructure for electronic bill of lading settlement



Towards a cooperative ecosystem: RLN's progress to date

A multi-phase project to design, implement and test a concept for a new FMI (Financial Market Infrastructure) and 'platform for innovation' in the UK that would deliver a new multi-asset, multi-issuer programmable tokenisation platform, whilst also providing interoperability across all forms of money in a way that provides functional consistency and promotes the singleness of the money



The objective is to prove technical feasibility of RLN concept and the potential business transformation impact for customers, firms and FMIs.

Use cases:

- Cross-border GBP/USD payments
- Derivatives clearing margin management

The purpose is to identify and assess the optimum use case(s) for a proof of concept (PoC) in UK from a business, legal and technology perspective.

Use cases:

- Consumer domestic payment
- Wholesale cross-border payment
- Securities settlement (repo)

The aim is to deliver a full-scale PoC across the selected retail and wholesale use cases, as well as supporting business and legal analysis to progress the concept towards the next phase:

Use cases:

- Peer-to-peer ("P2P") marketplaces
- Home buying journey
- Settlement of tokenised bond

Following the delivery of the experimentation phase, the RLN concept could be further developed from a technical, legal and business perspective in a design phase, where key design choices are made that could lead to build and live production

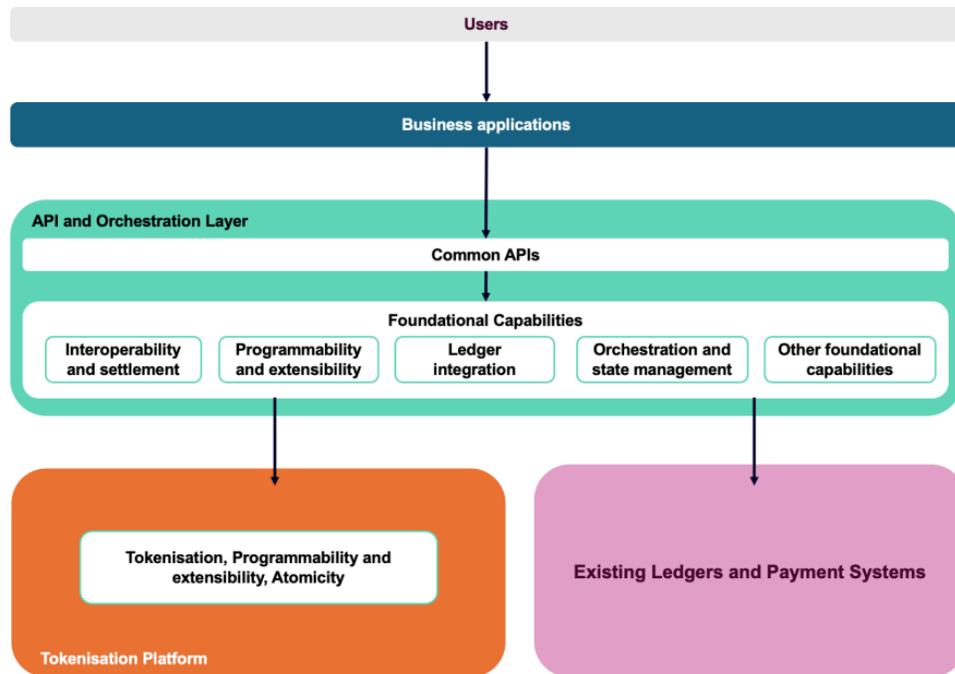


Understanding the technology components of RLN Experimentation phase

The platform for innovation's architecture is envisioned to include multiple layers and capabilities

During the Experimentation Phase, the original RLN concept evolved to become the platform for innovation

The platform for innovation is envisaged as a new type of FMI across multiple forms of regulated money...



...which could enable a set of foundational capabilities.

Simple push payment	Interoperability
Programmability	Locking/Unlocking funds (programmability)
Settlement finality	Settlement through API integration with FPS, Omnibus or RTGS
Connector for 3rd party applications	Notifications
Enable external capability	Interoperability (across ledgers)
Payment sequence orchestration	Pull payments capability
Tokenisation of commercial bank money (deposits)	Project wCBDC and rCBDC on shared ledger

Towards a Cooperative Ecosystem

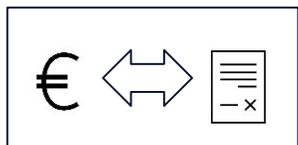
Presentation to the ECB – NTW Contact Group

Towards a Cooperative Ecosystem

What are the different models of connectivity and what has been our experience so far?

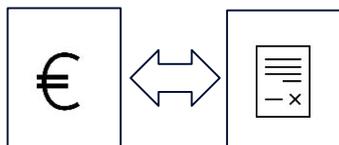
Composability on a single bank ledger:

Example: commercial bank money and tokenized assets.



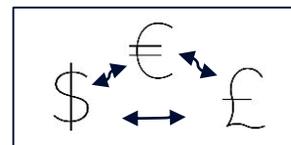
App to App connectivity:

Example: commercial or central bank money on one platform and assets on another platform.



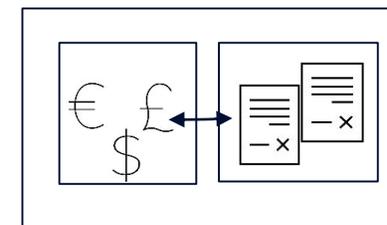
Shared ledgers:

Example: Connecting to a shared platform with other industry participants (for example via holding a node on the shared ledger).



Within a platform on a larger scale:

Example: Multi purpose, multi asset, multi application on a shared ledger platform.



Time to market
Technical readiness

Fragmentation
Evolution

Collaboration

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A decorative horizontal bar spans the width of the slide. It features a dark blue background on the left, transitioning into a pattern of small white and blue squares, and ending in a solid light green color on the right. Below this bar is a white rounded rectangle containing the main text.

Call for presenters at the next meeting of the NTW-CG

Bert Staufenbiel, KfW and Christoph Hock, Union Investment
ECB, Online-meeting, 26 November 2024

View of KfW on further developments (I/II)

Still a lot to learn and develop

Keeping the momentum after the exploratory work

- We believe we made an **significant progress** in the development from our first to our second issuance of a blockchain-based digital bond
 - further efforts in developing scalable products make particularly sense only if we can **build on the already achieved accomplishments**, esp. DvP mechanism in the settlement process in central bank money.
 - Our long-term view in the participation of exploration with DLT in the capital markets environment we need **scalable products**
 - Therefore, further use cases should in our view contain product **features** that **enable scalability**.
 - Further potential fields of exploration:
 - **Usage of smart contracts** for the processing, e. g. coupon payments, improvements of DvP mechanism
 - Building and strengthening of **secondary market liquidity**, e. g. via EU DLT Pilot Regime, ECB eligibility, repo market
 - Usage of **different DLT systems**, e. g. private-permissioned networks
 - Development of **internal readiness**, e. g.
 - building APIs towards essential project partners, e. g. crypto securities registrar (for transmitting instructions) or wCeBM/DLT-based central bank money solution provider, e. g. Bundesbank Trigger Solution (**from U2A to A2A connection**)
 - **strengthening BCM** aspects, e. g. via onboarding of more than one business partner in various issuance roles, e. g. crypto securities registrar, crypto custodian

View of KfW on further developments (II/II)

Cooperation and joint development are key elements

Cooperative ecosystem

- In our view, **cooperation is the key** for a successful and scalable ecosystem for DLT adoption in capital markets.
- However, the current ecosystem is facing a **substantial degree of fragmentation** in various dimensions, e.g. legal frameworks, company specific tokenisation platforms/solution, with an **unclear degree of interoperability**
- Therefore, in our view, the first step into a more scalable ecosystem is **transparency over the manifold initiatives** to achieve more and more standardisation and thus scalability

How to avoid fragmentation?

- **Develop use cases jointly** with a large number of market participants across a wide range of sectors/branches in order to maximize the learning journey and to avoid fragmentation as best as possible

Lessons learned in a nutshell

1

Relevance of Token Economy and Digital Assets: Link to clients, products, infrastructure

2

„What's in it for the client?“: Quicker settlement processes, reduction of risk, lower costs, efficiency gains; challenging of existing oligopolies and intermediaries; creation of new, partly decentralized roles

3

Trust and acceptance are key: Regulatory framework and education in the focus; creation of competitive edge as a part of dCMU (digital Capital Markets Union); strong collaboration of all relevant stakeholders required

4

Creation of technological readiness: NPP (Art. 9 KAMaRisk); definition of each step in investment process („check list“); risk assessment of blockchain, analysis of role of registrar and custodian for tokenized bonds

5

Next steps: Combination of assets and cash on chain (WCeBM); standardisation; MTFs for secondary market trading; eligibility for collateral, functioning repo market, programmability via smart contracts; measurement of carbon footprint

Thank you

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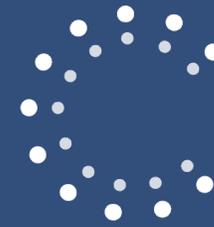
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Agenda item 3: Presentation by SWIAT & DekaBank on Regulated Layer One initiative

Background: Regulated Layer One, a blockchain network initiative between DekaBank, LBBW, SC Ventures by Standard Chartered, and SWIAT for the financial industry was presented. The presentation outlines how the SWIAT Network - that has been used for trial issuances during the Eurosystem exploratory work - intends to transition into a structure where institutions cooperate on a joint blockchain layer and jointly run the governance for it.



Regulated Layer One

Regulated Layer One (RL1)

10th ECB NTW Contact Group Meeting

SWIAT ECB Trials Transactions



 ECB Trials July 2024



DVP Institutional Bearer Bond

- **Issuer & Registrar:** DekaBank fully-fledged eWpG License
- **Investor:** Bankhaus Metzler
- Bundesbank Triggerchain

 ECB Trials July 2024




DVP Registered Bond

- **Issuer:** BayernLB
- **Investor:** Stadtsparkasse München
- **Payment Provider:** Helaba
- Bundesbank Triggerchain

 ECB Trials September 2024





DVP Corporate Bearer Bond

- **Volume:** 300 Mio. EUR
- **Issuer:** Siemens – **Registrar:** DekaBank
- **Investors:** DZ BANK, LBBW, BayernLB, Helaba
- **Payment Provider:** Deutsche Bank
- Bundesbank Triggerchain

 ECB Trials September 2024




DVP Registered Bond

- **Issuer:** Sparkasse Dortmund
- **Investors:** DekaBank
- **Payment Provider:** Helaba
- Bundesbank Triggerchain

 ECB Trials October 2024



DVP Institutional Bearer Bond

- **Issuer & Registrar:** DekaBank fully-fledged eWpG License
- **Investor:** LBBW
- Bundesbank Triggerchain

 ECB Trials October 2024



DVP Registered Bond

- **Issuer:** LBBW
- **Investor:** DekaBank
- Bundesbank Triggerchain

 ECB Trials November 2024



Repo

- **Involved Entities:** Deka & LBBW
- **Asset:** Tokenized Securities
- Bundesbank Triggerchain



Our key insights from the ECB-Trials



The **ECB-Trials** have **exceeded** our **expectations** and have shown us that digital **central bank money is vital** for the financial industry in making the next step in blockchain adoption and **maximizing blockchain-based benefits**.

- ✓ solves real pain points
- ✓ integrates seamlessly
- ✓ works as expected

The Tower of Babel – A Symbol of Chaos

According to the biblical story, the people of Babylon sought to build a tower that would reach the heavens.

However, their efforts were thwarted when suddenly everyone began speaking different languages and could no longer understand each other.

Communication became impossible, and the tower was left unfinished

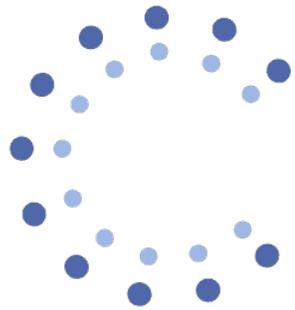


The Challenge

How to organize and manage a **global, open, and interoperable network** for the **financial service industry** that is:

- compliant
- secure and robust
- governed by regulated members
- credibly neutral





Regulated Layer One

A **global, open** and **interoperable network** for the **financial service industry**.

- Basel SCO60 compliant*
- Market neutral & governed by regulated members
- Secure and distributed infrastructure
- Live with 9+ Nodes & 25+ Participants

Embedded in IMF's ASAP Model¹, RLI sets the technical foundation for a powerful shared market infrastructure

Access

Access capabilities to the underlayers

Service

Services that handle / utilize assets

Asset

Functions that define assets

Platform

Infrastructure functions supporting the upper layers

RLI provides a **market neutral distributed transaction layer** allowing **synchronized exchange of value** and a **trustworthy runtime environment** for regulated financial markets.

- Supporting existing global principles for FMIs²
- Compliant with requirements for digital asset networks (BCBS, FATF, IOSCO)³
- EVM Based, interoperable and privacy preserving

- Execution/ Runtime, Storage, Communication, Consensus, Identification, Authentication, Authorization -

¹International Monetary Funds; ASAP: A Conceptual Model for Digital Asset Platforms

²Bank for International Settlements; ; [Principles for Financial Market Infrastructures](#)

³BCBS Standards on Prudential Treatment of Crypto Assets, IOSCO's recommendations on Crypto and Digital Asset Markets, FATF's recommendations Virtual Assets and VASPs

Clearly defined Roadmap



1 Initialization of Network

- Technical design and development
- Network terms
- Spanning up Validator Network
- Testing & Go-Live
- >EUR 550m Volume Settled in 2024
- 27+ Participants – Initiators:



2023-2024

2 Market Sounding

- Sounding Interest from selected market participants
- Bilateral Presentations and Q&A Calls
- Technical Deep Dive Sessions with the SWIAT Team
- Expression of in principle Interest (Iol)
- Invitation to On-Site Meeting on 19th / 20th March 2025 as Kick-off for next project phase

until 12/2024

3 Project Kick-Off

- **Phase 1:** Joint Evaluation of Legal, Technical and Economic Aspects with regards to the setup of an independent RL1 legal entity
- **Phase 2:**
- Set-up RL1 Foundation
- Carve-out network & validator set-up into RL1 Foundation
- Governance set up

from 03/2025

« RL1's Governance Design supports the network's mission and assures no single company, small group of developers or node operators has undue control over the network. »*

*Providing a global, open and interoperable network for the financial service industry

A sustainable and long-term Governance is achieved on various levels



Access

- **Non-discriminating access** to the network based on **fair conditions**
- **Empowering an Open Ecosystem** of DLT-Apps and Network Operators
- A **fair** and **predictable fee structure** for members and DLT-App operators



Accountability

- **Regulatory compliance** of network and **robust security**
- A **collusion-resistant consensus mechanism** with clearly defined **settlement finality**
- **Clear rules** for **network usage** and sanction mechanism for misuse



Coordination

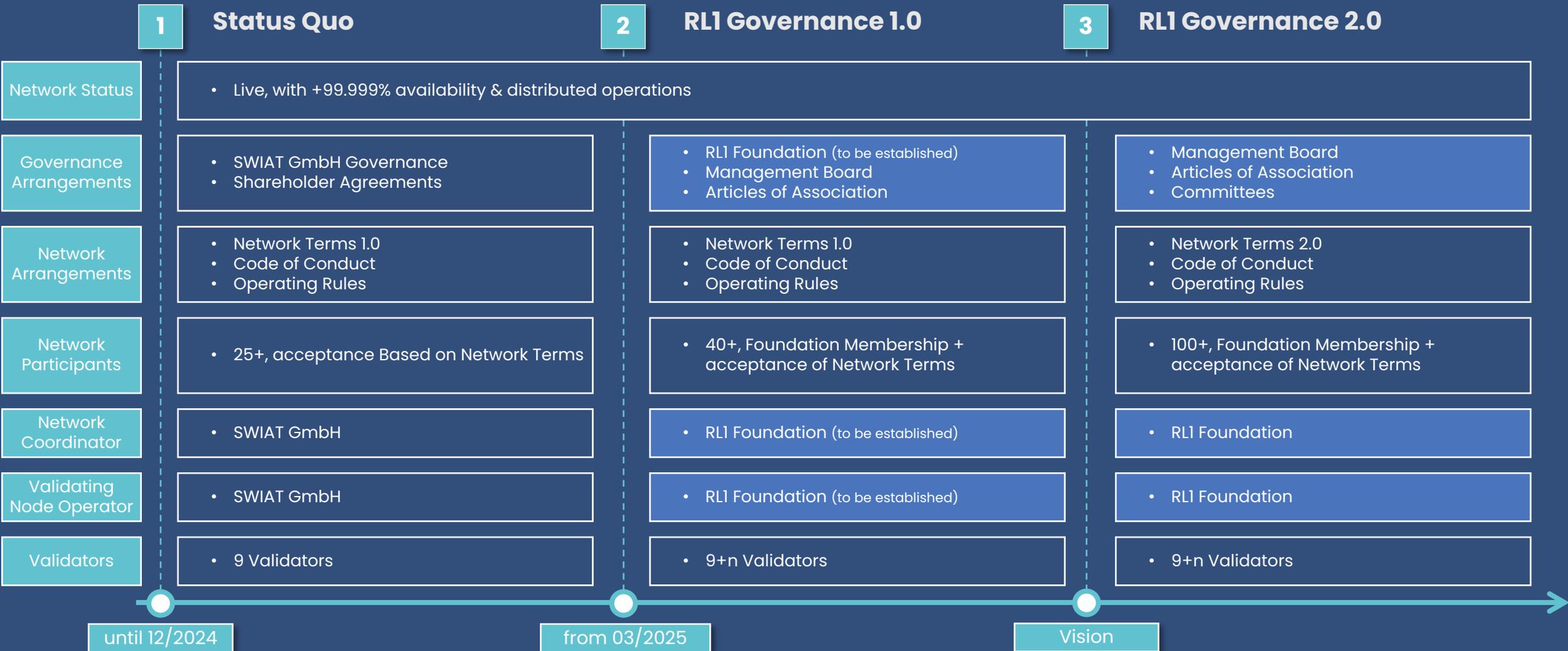
- A **transparent governing body** that coordinates the interests of the network members, DLT-App Providers and Node Operators
- **Efficient decision-making mechanisms** based on aligned interests
- **Economic sustainability** and **longevity** of the network foundation
- **Strategic Partnerships** and **Alliances**



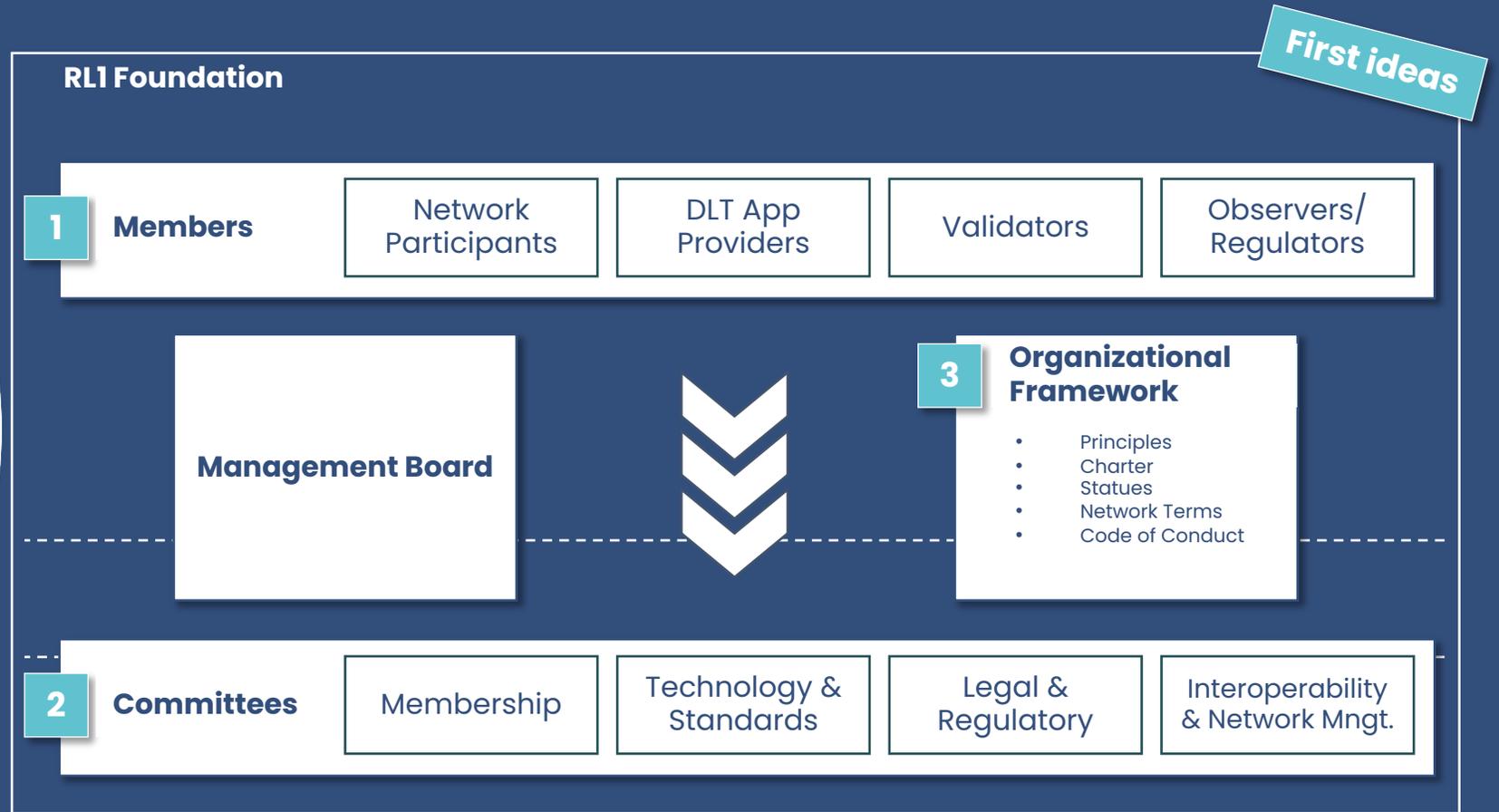
Operations

- A **clearly defined network operating model**
- **Fair** and **predictable compensation** and incentives for network operators
- **Non-discriminating rules** for **node operators**
- **Efficient, scalable technologies** and continuous innovation process

Transitioning to a neutral foundation / cooperative



RL1 Foundation provides the market neutral governance backbone for the network



Your time to act!

“Interoperability at scale across markets requires the establishment of common approaches and standards, inspired by the success of the internet interoperability.”¹



Get in touch with us and jointly form RLI

- Establishing **RLI Foundation** (Cooperative Organization) as a market neutral, well governed organizational backbone
- **Scaling the network** through partnerships and adoption of regulated institutions.

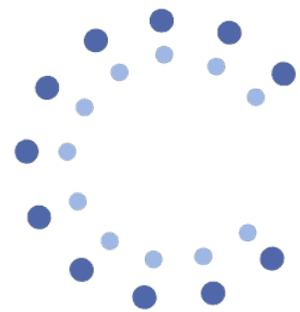


Contact

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¹ International Monetary Funds; ASAP: A Conceptual Model for Digital Asset Platforms



Regulated Layer One

Appendix

About Regulated Layer One

Regulated Layer One (RL1) is a market neutral initiative to form a **global, open and interoperable network** for the financial service industry based on clear network governance and comprehensive **regulatory compliance** (PFMI, BCBS, FATF,). RL1 is **a proven live network** with low entry barriers that **promotes innovation** and **collaboration** in the capital market sector.

RL1 initiative is run by Standard Chartered, LBBW, DekaBank and SWIAT. The **RL1 Network** is an **EVM-based permissioned network** that is **market neutral, trustworthy** and **without crypto currency** involvement. Well embedded into IMF's **ASAP conceptual model**, RL1 serves all functions of the base platform layer in a digital asset market. It provides a market neutral distributed transaction network allowing synchronized exchange of value and a trustworthy runtime environment for regulated financial markets.

RL1 network is designed to support **various types of regulated financial assets**, tokenized central bank money and commercial bank money on a shared ledger infrastructure. The network has been **live since early 2023** and offers a **quick start** for global financial markets into tokenized and programmable market infrastructures.

RL1 **combines the advantages** of a decentralized network structure with the benefits of a clear operating model. The network is live and running with 9 independent, **reputable validators**. The structure of the network is **truly decentralized** with high availability of 99.999%. The network governance is well established, including code of conduct, network terms and operating rules.

RL1 network provides all necessary foundational functions to develop, deploy and use applications for the financial industry along the **capital market value chain**. Extensive use cases have already been implemented in areas such as **collateral management, issuance of bearer bonds** and **credit claims**. **First transactions** were already processed via the **network in 2021**. RL1 is part in the ECB trials for wholesale settlements on new technologies and among others performed DvP transactions integrating with the target system.

RL1 initiative is currently expanding its Market Interest Group and will shortly establish the RL1 Foundation as a market neutral, well governed organizational backbone.



Regulated Layer One at a glance

A **global, open** and **interoperable network** for the **financial service industry**.

- Basel SCO60 compliant
- Market neutral & governed by regulated members
- Secure and distributed infrastructure
- Strong legal framework with clear roles & responsibilities
- Network Status: **Live**, with **99,999...% Availability**
- **Network Participants: 27+; >EUR 550m Volume settled YTD 2024**
- Currently **9 Network Validators** with 6 more to come:

Significant Placements on RL1:



- Trials**
- First digital securities transaction with wholesale CBDC
 - DvP of a digital registered bond and digital wholesale euro

SIEMENS

- EUR 300m digital Bond Issuance with automated Delivery-vs-Payment Settlement in connection with the Bundesbank Trigger Chain



- Two issuances of each 100m mortgage-backed security ("Pfandbrief")

DekaBank

NTT DATA

GFT

scventures |

sopra

adesso

LB



With 27+ Participants RL1 is Europe's largest Blockchain Network dedicated to the regulated financial service sector.



Appendix

About RL1 Foundation



The aim of the RL1 Foundation is to promote and support the **growth of the RL1 network**. It works to strengthen member **collaboration and innovation**. It is focused on creating a **sustainable ecosystem around RL1** and the global financial market, encompassing all aspects of standard setting and technical development. It plays a central role in fostering innovation and technology by providing a **platform for collaboration and resources** that enables members to work together on solutions that advance the network. The Regulated Layer 1 Foundation is a **European co-operative** owned by its members and subject to EU law. Within the Foundation, the participating institutions have **different levels of participation** based on their membership and their role in the RL 1 network. It is the **umbrella organization** to support the **mission of the RL 1 network "Providing a global, open and interoperable network for the financial service industry"**. It ensures that no single company, small group of developers or node operators has undue control over the network. The RL1 Foundation is therefore the central organization that **operates** and **manages** the RL1 network.

The RL1 Foundation has clear **principles for access, coordination, operations and accountability** for the RL1 network. With the involvement of all members, it leads to a reliable, **fair and trustworthy service** for the RL1 network. It also ensures that the **development** of the network remains at the **cutting edge**.

Hence, the Foundation is the **organizational backbone** of the RL1 ecosystem. It ensures the trustworthy and neutral participation of all members in various bodies of the organization. It defines the membership and the various bodies of the organization. Various incentives are created via the different **committees/councils**, including #1 further development of the **membership** base # **security** and **compliance** of the network # State of the art **technological development** 3# transparent **governing body** for **coordination** and above all #4 An overarching **operating model** for the network.

The foundation is about to be established and as the network is **no longer a theoretical construct**, key parts of the foundation's governance are already in place. The Network Terms, including the Code of Conduct, have already been concluded with institutes for access and are ready for further development within the foundation. Furthermore, KYC procedures and ISO 27001 certifications are in place for accountability and **compliance** is ensured. Clear **rules and roles** (including Network Coordinator and various participation roles) are already clearly defined and delineated for coordination via the Network Terms. And last but not least, the RL1 network is live with a clear business case for the operations part.

The foundation thus sets standards for the network, promotes mutual control between members/participants and promotes innovation through its structure and business case

GL1 Principles are complementary to the RL1 design

Open and Standard-Based	<i>Technology specifications will be public and open, using industry standards and open-source protocols for ease of application development</i>	Open Source Technology	Node-as-a-Service Setup	ISO 27001 Certification
Compliant with applicable regulations and accessible to regulators	<i>The platform will comply with legal and regulatory requirements, with jurisdiction-specific controls at the application layer</i>	SOC Compliant	ECB Trials & Partnerships	
Well governed	<i>Clear and transparent governance and rules will ensure responsibility and accountability</i>	Network Terms	Code of Conduct	Network Coordinator Validating Node Operator
Neutral	<i>Designed to prevent control concentration within any single entity ore region, with decisions based on technical merits</i>	Network Terms	Code of Conduct	Clear Roles and Responsibilities
Fair	<i>Ensures fair competition among financial institutions, avoiding biased decisions</i>	Network Terms	Code of Conduct	
Accessibility	<i>Financial institutions meeting criteria can participate, with memberships costs promoting network integrity and stability.</i>	Network Terms	Code of Conduct	Validator Onboarding & KYC KYC Procedures Members/Participants
Financially Self-Sustainable	<i>Operates as an industry utility, using revenues from fees for operational costs and reinvestment to ensure sustainability</i>	Node Compensation Model		

Implemented RL1 Governance Aspects (1/2)

Access	Network Terms	Clearly state the roles that can be occupied by members of the RL1 Foundation and the relationship between them. These roles are thoroughly distinguishable through a distinct definition. Furthermore, the access to the Network is described. The Network Terms are subject to ongoing development.
	Code of Conduct	The Code of Conduct entails specification to Platform Functionality and Responsibilities, Platform Commitments, Login data, Damage, Competition and Incident management. It will be developed on an ongoing basis in accordance with the evolvement of the RL1 network and provides guidelines and principles.
Accountability	SOC Compliant	The RL1 Network is SOC compliant, showcasing adherence to rigorous standards for data security, availability, and confidentiality, thereby ensuring robust protection and trustworthiness in its services.
	ISO 27001 Certification	The RL1 Network is ISO 27001 certified, demonstrating commitment to the highest standards of information security and ensuring robust and effective controls to protect sensitive data.
	Validator Onboarding & KYC	Thorough processes for the onboarding of Validators as well as the corresponding KYC procedures are in place and well-established.
	KYC Procedures Members/ Participants	Members/Participants must undergo thorough KYC procedures during onboarding, which include verifying credentials, conducting financial and compliance checks, and ensuring adherence to regulatory standards to maintain network integrity and security.

Implemented RL1 Governance Aspects

(2/2)

Coordination	Clear Roles and Responsibilities	RL1 Roles and Responsibilities are clearly defined and offer guardrails and security to all participants of RL1. The Roles and Responsibilities are defined within the Network Terms.
	Network Coordinator	The NC coordinates the establishment and operation of RL1 as a decentralized network operated by various Network Participants. Furthermore, it onboards and permissions companies and DLT-APPs, distributes revenue and coordinates network upgrades and validator list updates.
	ECB Trials & Partnerships	Through six fully automatized ECB transactions and further landmark transactions on the RL1 network, the RL1 Foundation has established deep-rooted partnerships with key financial institutes.
Operations	RL1 Network Go-Live	Building the backbone of the RL1 Foundation, the underlying RL1 Network is live since 2023 providing fully distributed operations with nine validators.
	Validating Node Operator	The role of VNO is clearly defined. It operates and coordinates a cluster of nodes on the RL1 Network with special privileges – the Validating Nodes – and provides its services to the Network Participants.
	Node Compensation Model	The model of how Nodes can earn compensation through transaction fees for participating in the consensus algorithm is in place.
	Node-as-a-Service Setup	Blockchain service providers can run and manage nodes on the RL1 Network to establish access to the platform.