



ธนาคารแห่งประเทศไทย
BANK OF THAILAND

Insights on wholesale and retail CBDC projects of Bank of Thailand.

Digital Currency Global Initiative

DC3 Conference – From Cryptocurrencies to CBDCs

January 25th 2022

Agenda

- **What the BOT has done so far with CBDC**
 - **Motivation / Vision for CBDC**
 - **Policy Implications**
 - **Wholesale CBDC – Project Inthanon**
 - **Corporate CBDC**
 - **Key Findings and Lessons Learned**
- **What's next?**
 - **mCBDC Bridge**
 - **Retail CBDC**





Technology can address long-standing painpoints in the financial system, especially in terms of efficiency and access/inclusion

Motivation



CBDC research and development in collaboration with the private sector, to better understand technology

Hands-on experimentation



Motivation / Vision for CBDC

CBDC can help to

- ensure financial, monetary policy, payment system and FI stability
- be the infrastructure of the digital financial system, which the private sector can use to build and innovate

Vision going forward



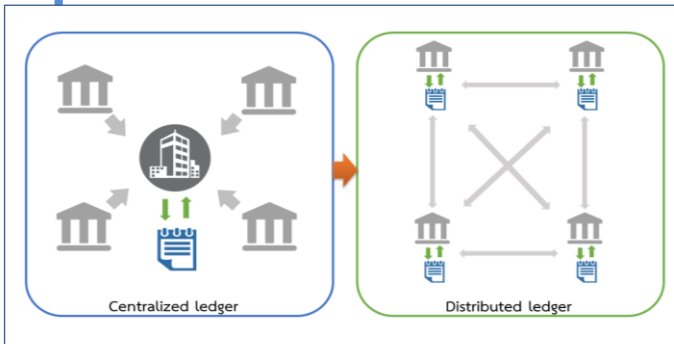


Inthanon Phase 1

(Aug 2018)

Explore DLT-based RTGS

- A prototype of decentralized RTGS
- Key functionalities
 - Cash/Bond tokenization
 - Bilateral Transfers
 - Queuing Mechanisms
 - Gridlock Resolution
 - Automated Liquidity Provision

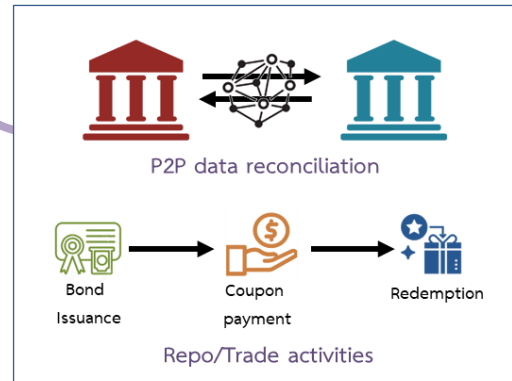


Inthanon Phase 2

(Jan 2019)

Enhance DLT functionalities

- Fraud prevention for 3rd party funds transfer
- Compliance for non-resident regulation
- Bond life-cycle (Interbank bond trading and Repo)

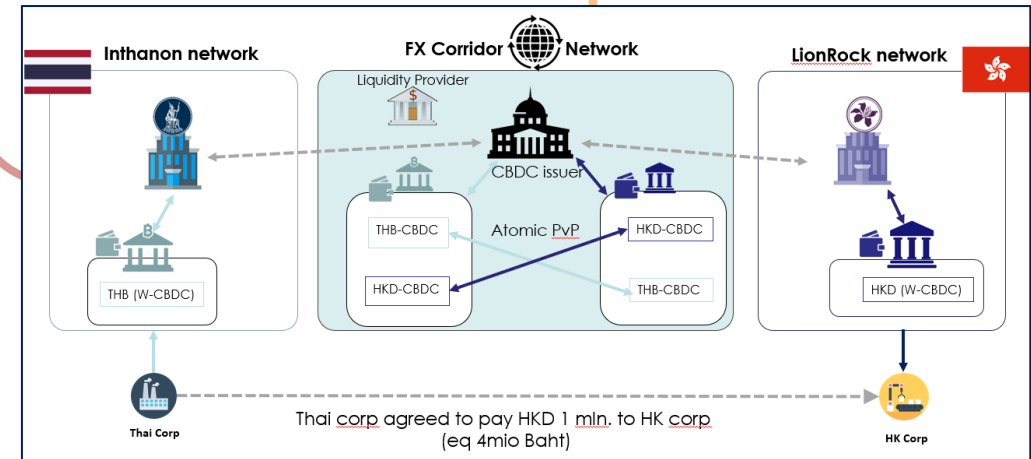


Inthanon-LionRock

Phase 1 (Sep 2019)

Enhance cross-border funds transfers

- Cross-border funds transfer
- Atomic PvP settlement
- Payment with FX embedded
- Liquidity management
- Regulatory compliance



Inthanon-LionRock Phase 2

(mBridge) (Sep 2020)

Ongoing

Multi-currency cross-border corridor

- Multi-currency scalability
- Support real-sector business cases
- Governance / legal study
- Non-functional testing





Get your hands dirty! Lessons learned from our hands-on experimentations:

Technology

- DLT has **some limitations in terms of performance and scalability** to handle large retail transaction volumes and **preserve users' transaction privacy**.
- Nevertheless, DLT offers **greater security and resiliency** through the usage of cryptographic techniques, and also **programmability which opens avenues for innovation**.

Business

- **A 24/7 corridor network affects existing operations**, since domestic systems do not run 24/7 and CBDC must be reserved for off-hour transactions
- **Elimination of correspondent banks causes shortage of FX liquidity**, must introduce role of liquidity provider or establish liquidity saving mechanisms
- Atomic nature of corridor network makes compliance with **FX regulations difficult**





Objectives:



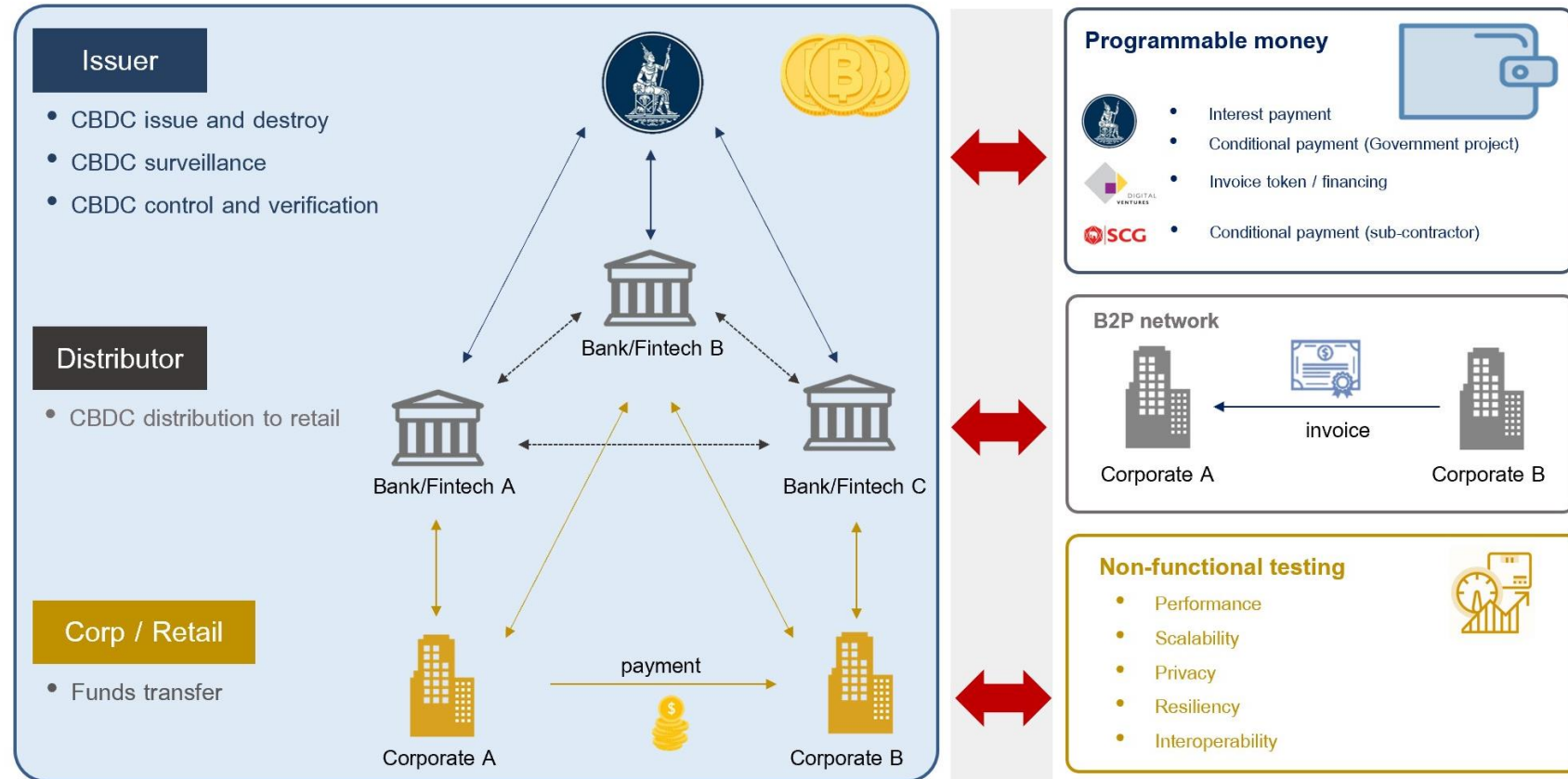
Improve efficiency / reduce pain points in business payments



Evaluate functional / non-functional prototype features



Explore a blockchain-based payment infrastructure to help support innovation





Key Summary and Findings:



Two-tier model preserves FIs' roles, utilizes existing resources/ infrastructure



Basic functionalities e.g. issuing, destroying, distributing, transferring CBDC were achieved



Complex functionalities e.g. invoice tokenization and programmable money are achievable through smart contracts



Resiliency is a key strength from deploying multiple validating nodes



System scalability and performance remain challenges as blockchain still does not allow for a robust and large-scale infrastructure.



Transaction privacy can be preserved by employing cryptographic techniques, but at the sacrifice of system performance



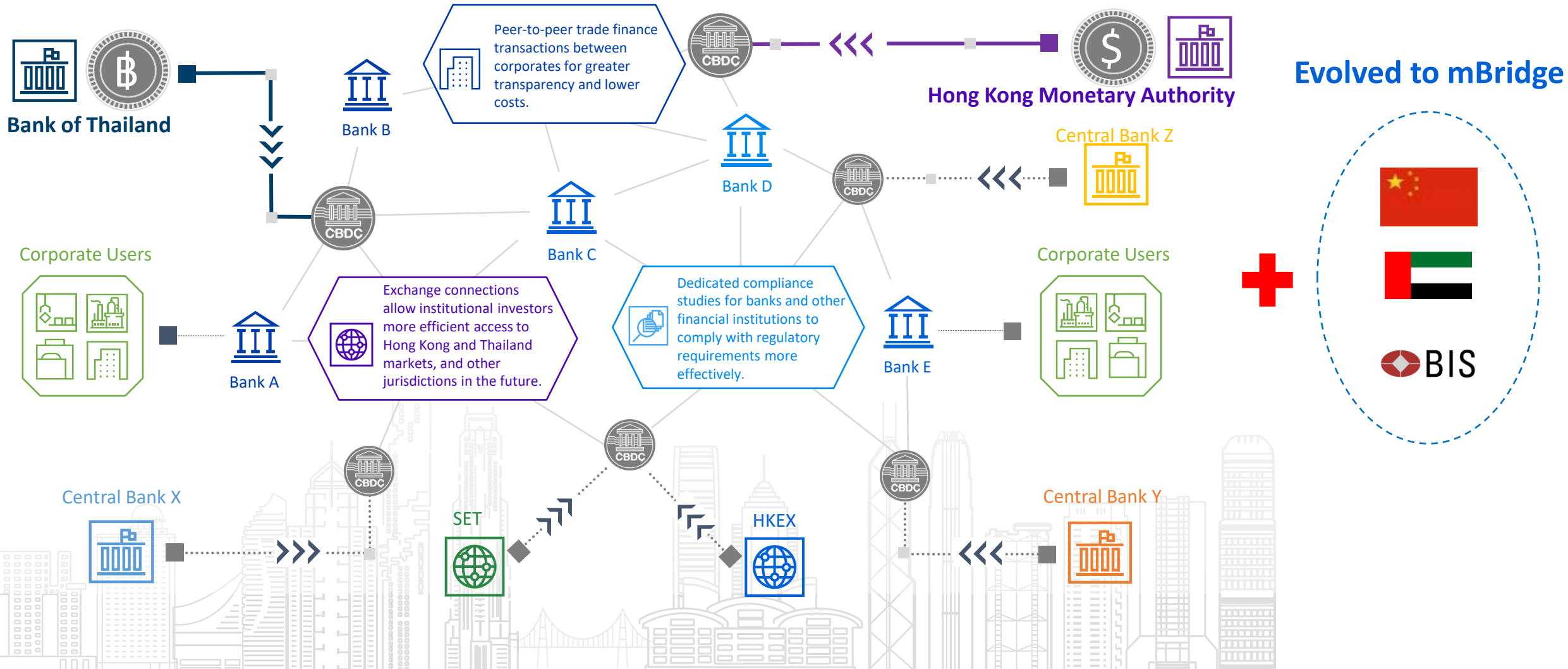
Report published 8 March 2021

What's Next? #1: Inthanon-LionRock Phase 2 → mCBDC Bridge

Corridor Network (extended)

Prototype to allow central banks, member banks, corporates and exchanges, to utilize CBDC to make multicurrency cross-border payments inside the corridor network.

(Ongoing)



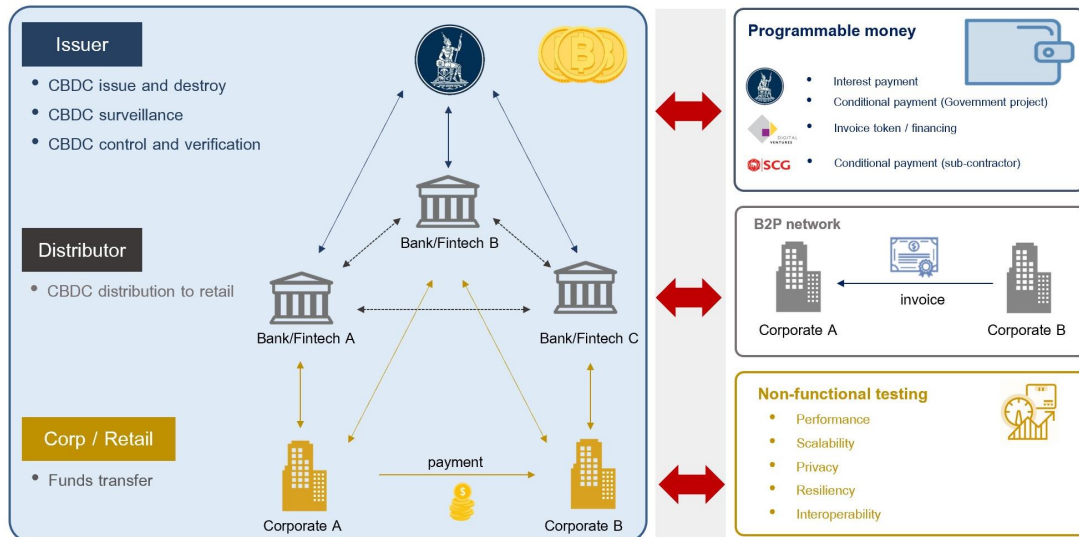


BOT-SCG-DV Project

(Jul 2020)

CBDC for business applications

- Two-tier architecture design
- Integration of CDBC system with B2P platform
- Invoice tokenization
- Conditional payments
- Non-functional requirements testing



Retail CBDC

(Dec 2020)

General use CBDC for the public

- Cost-benefit analysis of opportunities/challenges/risks
- Stakeholder engagement
- Design considerations
- Readiness assessment

What's next?

(2021-2023)

- POCs of Retail CBDC
- Small-scale pilot testing





The BOT's Key Motivations in Exploring Retail CBDC

Stakeholders

User



Households



Businesses

Intermediaries



CBDC Distributor/
Operator



Payment Interface
Providers

Central Bank



Central Bank

Benefits of Retail CBDC

- Provide a safe and reliable digital form of central bank money
- Enhance innovation and competition in financial services, and support the digital economy
- If widely adopted domestically, some private digital currencies could displace the Thai Baht, impacting monetary sovereignty and financial stability. CBDC could offer an option to provide continued access to central bank money

Challenges from Retail CBDC

- Money laundering and other illicit activities
- Banking disintermediation
- Digital run
- Incentives for CBDC distributors
- Impact on monetary policy, financial stability and financial landscape
- Maintain high security standards
- Instill public trust
- Data governance

BOT's Preliminary Retail CBDC Design Choices

As payment instrument, CBDC would...



Have different levels of privacy depending on the types of accounts



Open for development (API or Smart Contract level)



No interest-bearing (for now)



Free, or minimal cost for larger transaction amount

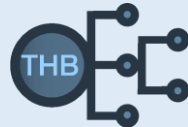


Cap on amount transferred, spent or converted depending on the types of account, and usage purposes

As CBDC system, we choose...



Issue CBDC as digital token



Use hybrid technology (centralized + decentralized) for CBDC transaction verification and settlement



Two-tiered CBDC distributing model which relies

For Standards, rules and regulations to govern CBDC system...



Participant roles & responsibilities



Standards & regulations



Compliance & risk management

Etc. (if any??)



Key takeaways:

- Promising opportunities of CBDC for Thailand:

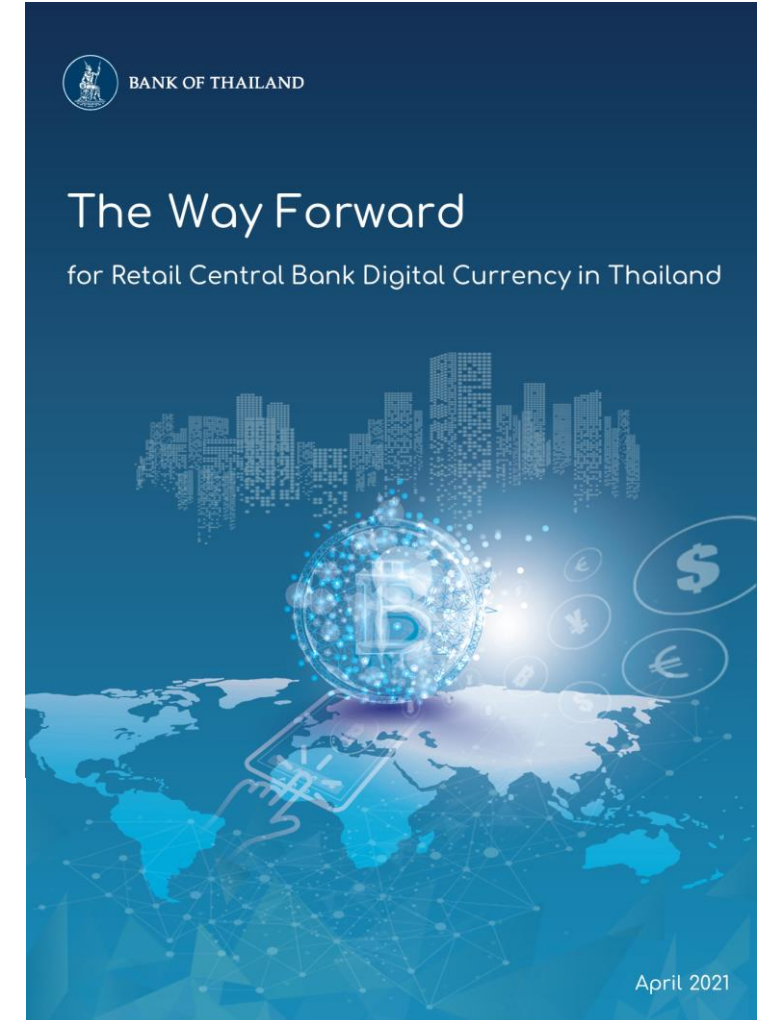


1) To be a digital form of central bank money that is safe, reliable and accessible by the public



2) To be an open digital payment infrastructure that supports inclusion and financial innovation in the digital era

- Risks such as banking disintermediation and digital runs can be mitigated through the CBDC design
- Preliminary design suggestions:
 - Two-tier distribution model
 - Non-interest bearing, with holding/transacting/conversion limits
 - Both centralized and decentralized technologies
 - Zero-to-minimal transaction costs for end users
 - Open to private sector programmability



Paper published 2 April 2021



Wholesale CBDC

CBDC for corporate

INTHANON
Phase I
An application of Distributed Ledger Technology for a Decentralised Real Time Gross Settlement system using Wholesale Central Bank Digital Currency

BANK OF THAILAND
CH & Co



INTHANON
PHASE 2

Enhancing Bond Lifecycle Functionalities & Programmable Compliance Using Distributed Ledger Technology

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Inthanon-LionRock
Leveraging Distributed Ledger Technology to Increase Efficiency in Cross-Border Payments

BANK OF THAILAND
HONG KONG MONETARY AUTHORITY
香港金融管理局



Central Bank Digital Currency: The Future of Payments for Corporates
Leveraging Technology to Enhance Efficiency and Innovation in the Business Sector

SCG
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Thank you