

THE DIGITAL EURO – A GUIDE FOR BANKS

Possible ways forward and steps to prepare
for the introduction of the digital euro

DIGITAL CURRENCIES & SMART PAYMENTS
WORKING GROUP

The Digital Currencies & Smart Payments Working Group of the Euro Banking Association conducted five discussion meetings in 2022 and 2023 with selected experts from its member community and several guest speakers from the banking and fintech community dealing with the digital euro. The results of these discussions are summarised in this paper.

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DISCLAIMER

The paper is the result of the work of the EBA working group “Digital Currencies & Smart Payments”. At the time the discussions of the working group took place, information on remuneration and a compensation model for intermediaries was not yet available. Therefore, the decision was made to not focus on these points during the discussions. Furthermore, THE PAPER is written based on publicly available information as of March 2023. Therefore, any developments occurring afterward are not taken into consideration here. This paper refers to banks as banks participating in the retail payments market and delivering payment services to private persons and businesses.

INTRODUCTION

With digitalisation at full speed, the European Central Bank (ECB) believes it must prepare for a digital future in which demand for cash may weaken, requiring the convertibility of commercial bank money into cash to be complemented by convertibility into central bank digital money. Therefore, the digital euro is envisioned to become the new monetary anchor of the Eurozone in the digital age.¹ Banks and payment service providers need to position themselves and identify their strategy to get ready for the potential realisation phase, which is expected to start as early as 2024, as the ECB has announced to decide on the way forward by the end of 2023.

The Digital Currencies & Smart Payments Working Group of the Euro Banking Association (EBA) has explored new, innovative payment developments since its inception in 2016 under the name of Cryptocurrencies, Smart Payments, and Stablecoin Working Group. In 2022, the focus of the working group shifted to explore use cases and options that the introduction of a digital euro may offer for the banking industry. This report presents the findings of the working group.

In particular, the report focuses on the impact a digital euro is likely to have on banks and their role in the emerging digital euro ecosystem with regard to the retail payment market, the strategic options banks and other supervised intermediaries have, the impact of a digital euro on the European payment industry as a whole. The report closes with suggestions regarding possible ways forward in time for an official decision on the launch of the digital euro. The discussions of the Working Group were held based on the assumption that the ecosystem has to prepare for a digital euro.

The report suggests that banks should proactively investigate the impact the introduction of the digital euro will have on their business to mitigate risks and to actively collaborate with other participants in the market to identify and benefit from potential network effects. It is recommended that banks and other supervised intermediaries define a strategy for the digital euro before it is introduced if they have not done so already.

¹ Fabio Panetta 2021, Central bank digital currencies: a monetary anchor for digital innovation,
[https://www.ecb.europa.eu/press/key/date/2021/html/
ecb.sp211105~08781cb638.en.html](https://www.ecb.europa.eu/press/key/date/2021/html/ecb.sp211105~08781cb638.en.html)

OUTLINE

Section 1 provides an overview of the status quo of the investigation phase regarding the digital euro, highlighting the major design choices made by the ECB and the Eurosystem as of March 2023.

Section 2 focuses on the newly emerging ecosystem of the digital euro. It summarises the use cases prioritised by the ECB in preparation for a potential launch. Subsequently, it describes the tasks and explains the distribution of responsibilities between the customer-facing intermediaries and the Eurosystem. The section concludes with an analysis of the type of intermediaries participating in the ecosystem.

Section 3 extrapolates possible options for banks on how to deal with the digital euro in the future. It elaborates on the options “ensure compliance”, “absorb and adapt”, and “expand business” by focusing on banks’ motivation, advised actions, and risks for each option.

Section 4 concludes with guidance on how the banking industry as a whole can move forward in the discussions surrounding the digital euro.

CONTENT

DISCLAIMER	4
INTRODUCTION.....	5
OUTLINE.....	6
1. INTRODUCTION TO THE DIGITAL EURO	8
1.1 The digital euro investigation phase – status as of March 2023	8
1.2 Decisions made by the ECB regarding the digital euro	10
2. WHAT KIND OF ECOSYSTEM IS EXPECTED TO FORM AROUND THE DIGITAL EURO?....	14
2.1 Use cases of the digital euro prioritised by the ECB that will shape the digital euro ecosystem.....	14
2.2 Tasks in the envisioned digital euro ecosystem.....	15
2.3 Responsibilities split between the Eurosystem and intermediaries	16
2.4 Potential intermediaries participating in the ecosystem.....	18
3. STRATEGIC OPTIONS FOR BANKS	20
3.1 Option 1: "Ensure compliance" – minimal investment to comply with regulatory requirements.....	20
3.2 Option 2: "Absorb and adapt" – seek synergies to enhance the existing revenue business	21
3.3 Option 3: "Expand business" – Seek completely new business opportunities	22
4. WAYS FORWARD FOR THE BANKING INDUSTRY.....	23
5. CONCLUSIONS.....	25
APPENDIX A: GLOSSARY OF TERMS.....	26
APPENDIX B: LIST OF SOURCES	28

1. INTRODUCTION TO THE DIGITAL EURO

1.1 The digital euro investigation phase – status as of March 2023

The digital euro is designed to be an electronic means of payment in all online and offline scenarios for private persons and business (end-users) in the Eurozone. It is bound to the euro currency by an assured 1:1 exchange and centrally issued by the Eurosystem. Thus, holding a digital euro will be equal to holding a cash claim against the Eurosystem in the form of a physical euro. Therefore, it falls under the category of a central bank digital currency (CBDC).

The Eurosystem currently discusses limiting the issuance to a maximum of 1.5 trillion digital euros to protect the European banking system² – an amount comparable to the amount of euro banknotes currently in circulation.³ Furthermore, the Eurosystem considers limiting the maximum digital euro holdings per capita. This maximum limit would be implemented as a safeguard to minimise the risk of a bank run in times of financial stress, a possible risk due to the envisaged instantaneous interchange between the digital euro and current account holdings. The Eurosystem will also prohibit the usage of the digital euro as an investment.

The ECB has stressed that the digital euro will be available only in retail transactions concerning person-to-person and person-to-business transactions.⁴ Business-to-business transactions are excluded from the current scope of the digital euro project (**Figure 1**).

Objectives. The ECB has set specific objectives to be achieved by the introduction of the digital euro.⁵ First of all, it aims at keeping up with market demand and responding to evolving needs of the digital economy and society. Secondly, it will preserve the authority of the system of central banks in the retail payments market, where many different payment schemes and solutions emerged in the last decade. Thirdly, with the growing uncertainties and geopolitical tensions, the digital euro intends to protect the strategic autonomy of European payments and monetary sovereignty by becoming a potential fallback solution, as outlined by the ECB. Last but not least, the digital euro aims at making the payment industry more efficient and fostering innovation in the private sector (**Figure 2**).

² ECB 2022, The digital euro and the evolution of the financial system
<https://www.ecb.europa.eu/press/key/date/2022/html/ecb.sp220615~0b859eb8bc.en.html>

³ ECB 2022, The digital euro and the evolution of the financial system

⁴ Fabio Panetta 2021, The ECB's case for central bank digital currencies,
<https://www.ecb.europa.eu/press/blog/date/2021/html/ecb.blog211119~fda94a3f84.en.html>

⁵ ECB 2022, Key objectives of the digital euro,
<https://www.ecb.europa.eu/press/blog/date/2022/html/ecb.blog220713~34e21c3240.en.html> and ECB 2022, The case for a digital euro: key objectives and design considerations,
https://www.ecb.europa.eu/pub/pdf/other/key_objectives_digital_euro%7Ef11592d6fb.en.pdf

FIGURE 1. Simplified illustration of the classification of the digital euro by BearingPoint

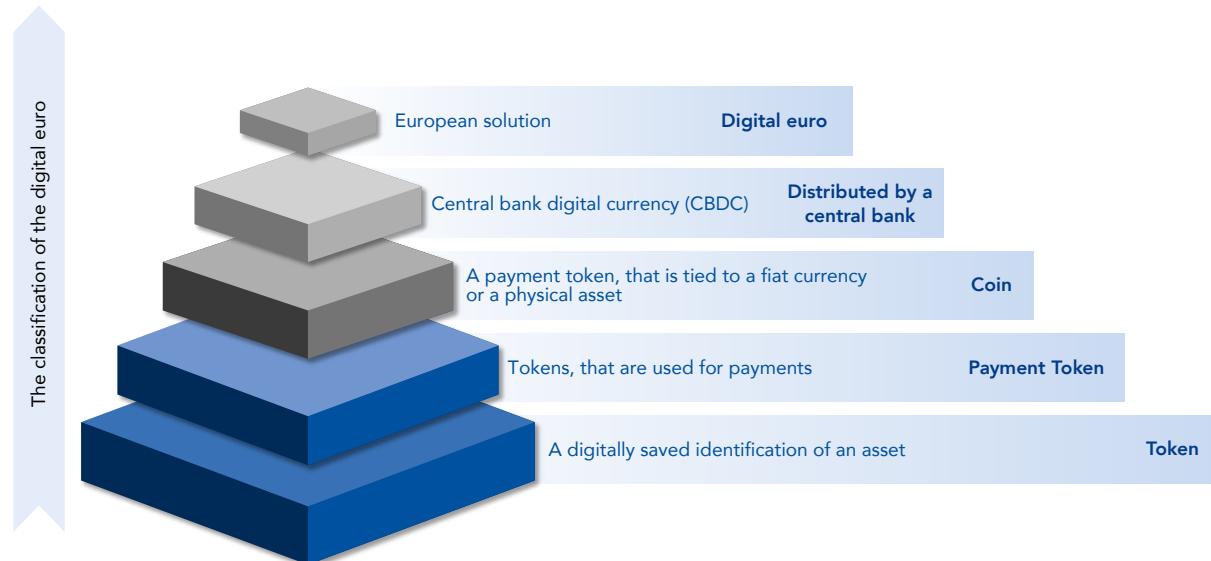
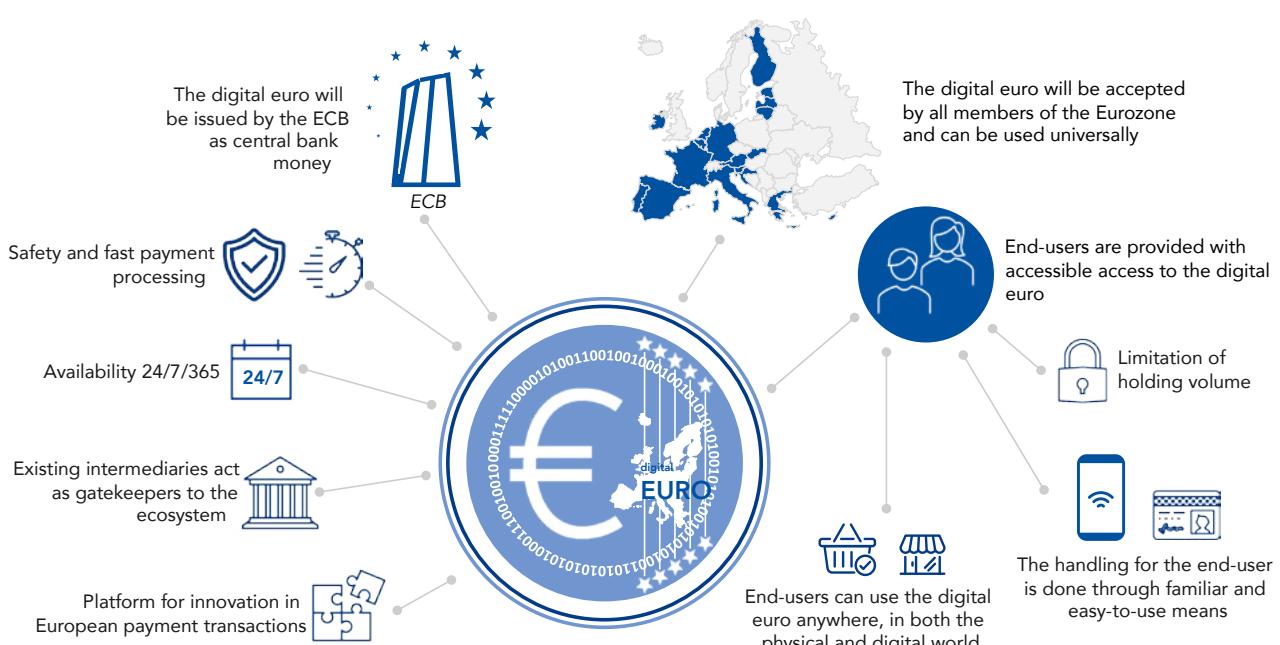


FIGURE 2. ECB objectives for the digital euro illustrated by BearingPoint



Status. Since the definition of the key objectives of the digital euro, the ECB published its first status report⁶ in September 2022 and a second status report⁷ in December 2022. Major design choices have already been made while others are in the final stages and will be made by September 2023.⁸ In the meantime, the ECB started different market research and experimentation initiatives to streamline the expectations of the participants and gather feedback on critical design choices (e.g., the Market Advisory Group (MAG) and technical sessions with the Euro Retail Payments Board (ERPB)).

To establish common rules, standards, and procedures in the distribution, the ECB proposed to publish a unique and clear “digital euro scheme” to which every intermediary must adhere. The work on the digital euro scheme rulebook has already started this year to foster the required change. In the upcoming months, the ECB will continue its work on further design choices. The Governing Council is expected to make a decision on the way forward in autumn 2023, which may already involve the start of the realisation phase.

1.2 Decisions made by the ECB regarding the digital euro

The following provides an overview of the major design choices communicated by the ECB:

Interplay of the Eurosystem and intermediaries.

According to the second progress report,⁹ the Eurosystem will collaborate closely with intermediaries. The ECB also states that all intermediaries will be supervised and must go through a registration process to be allowed to provide all services concerning the digital euro.

End-user contact. The ECB clarified that intermediaries would take over all end-user-facing activities, such as end-user onboarding or digital euro account management. There will be no direct interaction between the ECB and end-users of the digital euro.

Liability. The ECB strictly clarified that the digital euro would represent the holding of a direct liability against the central banks, as is the case with physical money today. This means that commercial bank money, exchanged into the digital euro, will leave the banking system. Instead, it will be kept as digital euro by the ECB.

Usability. The ECB stated the importance of both online and offline usability for the digital euro. This implies that the infrastructure needs to be designed in a way that enables transactions where none of the transaction devices are connected to the internet. As a result, the solution must be designed taking offline availability for end-user devices into account. As legal tender the digital euro must be accepted in the same way cash is today.

⁶ ECB 2022, Progress on the investigation phase of a digital euro, https://www.ecb.europa.eu/paym/digital_euro/investigation/governance/shared/files/ecb.degov220929.en.pdf?8eec0678b57e98372a7ae6b59047604b

⁷ ECB 2022, Progress on the investigation phase of a digital euro – second report, https://www.ecb.europa.eu/paym/digital_euro/investigation/governance/shared/files/ecb.degov221221_Progress.en.pdf?f91e0b8ff8cbd6654d7e6b071a8f7071

⁸ Fabio Panetta January 2023, The digital euro: our money wherever, whenever we need it, <https://www.ecb.europa.eu/press/key/date/2023/html/ecb.sp230123~2f8271ed76.en.html>

⁹ ECB 2022, Progress on the investigation phase of a digital euro – second report

Getting the digital euro. The ECB explained how issuance and redemption as well as funding and defunding are expected to work. The Eurosystem will take over the responsibility of issuing the digital euro and redeeming it if needed. Supervised intermediaries are responsible for providing access to the funding and defunding process to the end-users. The following illustration shows the funding and defunding process on a simplified level (**Figure 3**).

These funding and defunding processes are expected to be available 24/7/365 in online scenarios. End-users are supposed to be able to set automatic conversions from their current account to their digital euro account and vice versa, especially when the defined holding limits of digital euro are breached. The designed processes are called “waterfall” and “reverse waterfall” respectively. The waterfall process refers to the automated process of converting digital euro into commercial bank money in case end-users receive more digital euro than they are eligible to hold. Reverse waterfall refers to the process of automatic conversion of commercial bank money into digital euro in case end-users attempt to send more digital euro than they currently hold.

Settlement. The settlement process will be performed solely by the ECB, as the second progress report¹⁰ states. This process includes settlement verification and settlement recording. In offline payment scenarios, the initial transaction is executed using the end-users’ devices and sent to the Eurosystem at a later point in time as soon as the device is online again. Post-settlement tasks will be executed by both the Eurosystem and supervised intermediaries. The following illustration shows a simplified version of the payer-initiated payment process (**Figure 4**).

Accessing the digital euro ecosystem. The Eurosystem will provide a digital euro access gateway, the single point of contact for all intermediary services. Behind this access gateway, all digital euro components for settlement or data management are hidden. Intermediaries can access those components using their digital euro back-end services. All intermediary-specific components, for example, integrated banking apps, e-commerce plugins, or Point-of-Sale (POS) terminals, are connected to this back-end system, enabling access to the digital euro components hosted by the Eurosystem.

Technology. Decisions regarding the technological platform for the digital euro have not yet been made. Neither traditional technology solutions nor solutions based on distributed ledger technology (DLT) have been ruled out at this stage.

¹⁰ ECB 2022, Progress on the investigation phase of a digital euro – second report

FIGURE 3. Simplified illustration of the funding and defunding process from BearingPoint as described by ECB¹

¹ ECB 2023, Annex 1: Functional and non-functional requirements linked to the market research for a potential digital euro implementation,
https://www.ecb.europa.eu/paym/digital_euro/investigation/profuse/shared/files/dedocs/ecb.dedocs230113_Annex_1_Digital_euro_market_research.en.pdf?8f308548cc80b5f187a5560bd50e72ce

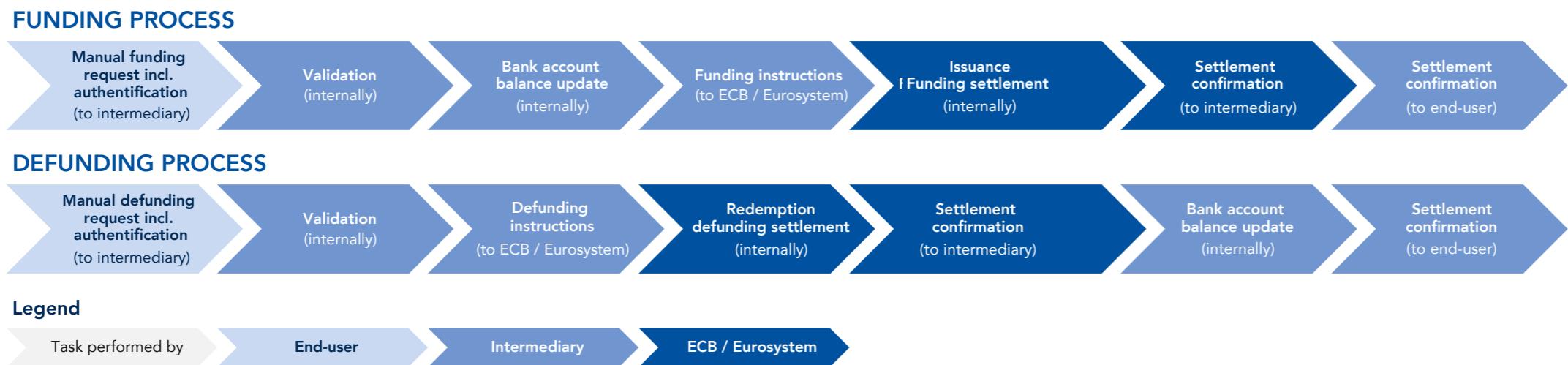
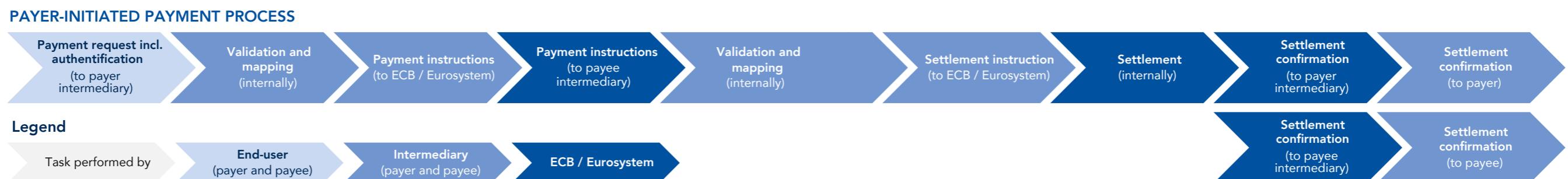


FIGURE 4. Simplified illustration of the payer-initiated payment process from BearingPoint as described by ECB¹

¹ ECB 2023, Annex 1: Functional and non-functional requirements linked to the market research for a potential digital euro implementation



2. WHAT KIND OF ECOSYSTEM IS EXPECTED TO FORM AROUND THE DIGITAL EURO?

The ECB prioritised a number of initial use cases for the launch of the digital euro which we will discuss first. Then, we will focus on the digital euro ecosystem and what it means for intermediaries. Finally, we will look at how responsibilities will be split between the Eurosystem and supervised intermediaries and discuss which stakeholders might take over some of the responsibilities in the digital euro ecosystem.

2.1 Use cases of the digital euro prioritised by the ECB that will shape the digital euro ecosystem

In the first progress report¹¹ on the digital euro investigation phase as well as in the digital euro use case analysis report¹², the ECB prioritised four use cases that are of particular importance and will be focused on from the beginning of the realisation phase (**Figure 5**).

Person-to-person payments. Person-to-person payments (P2P payments) refer to the exchange of digital euro between private persons in an easy, fast and secure manner without any additional cost. In other words, it is the digital form of handing over cash privately. While digital P2P payments are not yet commonly used in all European countries, they are expected to grow in the future throughout the Eurozone.

E-commerce payments. With the rise of online shopping, the number of e-commerce transactions

increased rapidly over the past years.¹³ Online shoppers usually can choose between a range of payment options for which e-commerce shops typically pay a fee to the payment provider, with fees varying according to the payment method. One of the benefits of the digital euro could be that it is expected to lower these payment processing fees while offering the additional benefit for businesses to receive the agreed payment instantaneously.

Physical stores. Recent years have seen a shift towards cashless transactions¹⁴, a development in line with the increase in e-commerce transactions. In order to enable brick-and-mortar shops to be able to receive payments with digital euro, existing software needs to be updated and existing hardware may have to be extended or replaced. While this necessitates investments, businesses would expect to benefit from lower (interchange) fees.

Government payments. This use case refers to payments between digital euro end-users and any government institutions in the Eurozone. The transaction can be initiated both by the end-user or the government.

Other use cases. Business-to-business payments or machine-initiated payments may become available at a later stage. Also, a wholesale digital euro for transactions between banks is not in scope for the launch. Further, the initial phase does not consider novel features of digital currencies, like programmability.

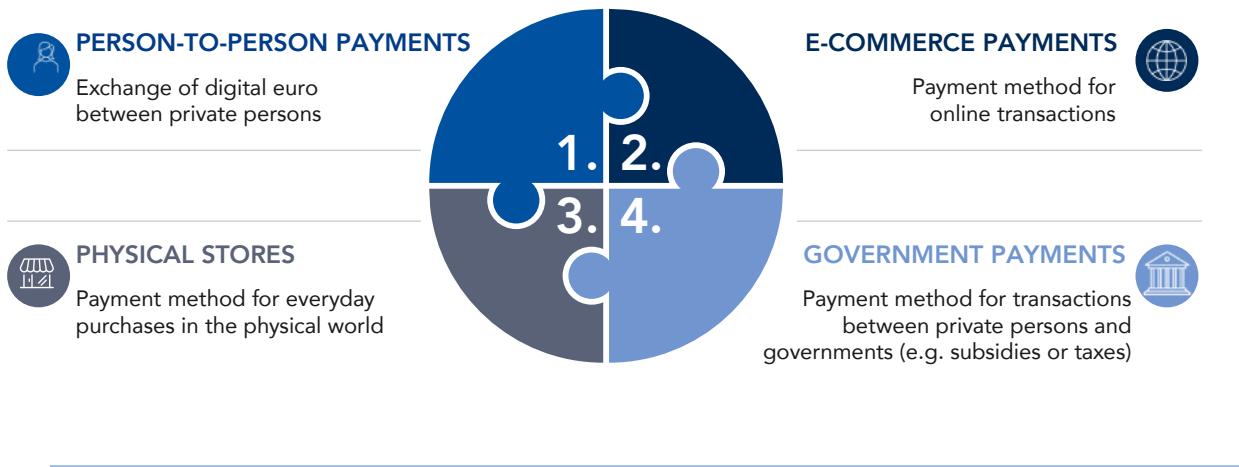
¹¹ ECB 2022, Progress on the investigation phase of a digital euro

¹² ECB 2022, Digital euro – use case analysis, https://www.ecb.europa.eu/paym/digital_euro/investigation/governance/shared/files/ecb-degov220504_usecase.en.pdf

¹³ ECB 2022, Study on the payment attitudes of consumers in the euro area (SPACE), https://www.ecb.europa.eu/stats/ecb_surveys/space/html/ecb.spacereport202212~783fdf46e.en.html

¹⁴ ECB 2020, Study on the payment attitudes of consumers in the euro area (SPACE)

FIGURE 5. Prioritised use cases for the launch of the digital euro



2.2 Tasks in the envisioned digital euro ecosystem

Following the use case prioritisation, the ECB published a first infrastructure draft¹⁵ outlining the tasks in the digital euro ecosystem. The ECB has grouped the tasks, which relate to both the Eurosystem and the intermediaries, based on functional and non-functional requirements.¹⁶ How responsibilities will be split will be explained in detail in the subsequent chapter.

User management. This includes all activities related to the registration and onboarding of users (including end-users like payers and payees, as well as intermediaries), the lifecycle management (managing users as long as they are a part of the digital euro ecosystem), and the offboarding process (in case a user leaves the digital euro ecosystem). Know-Your-Customer (KYC) and Anti-Money-Laundering (AML) processes need to

be put in place to ensure the eligibility of end-user applicants. As long as any end-users are using the digital euro, their data must be managed and protected by both the Eurosystem and any intermediary. Last but not least, the offboarding process also has to be managed securely and in a timely manner.

Liquidity management. This task concerns the management of the intermediaries' central bank accounts for the digital euro in both online and offline scenarios. Furthermore, it includes the handling of the interface with the TARGET central liquidity management component.

Interface management. This task includes all activities related to providing all necessary interfaces needed for connecting all digital euro components. These connections include the TARGET to digital euro interface, the digital euro to intermediary interface, and the intermediary to end-user interface. All interfaces need to be managed and can be provided, for example, in the form of functionalities integrated into existing apps or the issuance of new apps solely dedicated to digital euro services.

¹⁵ ECB 2023, Annex 1: Functional and non-functional requirements linked to the market research for a potential digital euro implementation

¹⁶ ECB 2023, Annex 1: Functional and non-functional requirements linked to the market research for a potential digital euro implementation

Data management. This task includes all tasks related to the management of data in the context of the digital euro. It consists of three main components. The first component is reference data management acting as a database for all reference data, configuration, and identity management. The second component is the data warehouse, which is collecting data from all components to provide storing, analysing, and reporting capabilities. The third component is fraud and risk management, which is responsible for all activities regarding fraud prevention, detection, and reporting.

Offline. This task includes all activities related to the offline functionalities of the digital euro. It includes the offline wallet and offline transactions. The offline wallet relates to the applications available to end-users, including options for offline settlements. Offline distribution refers to activities performed to provide end-users with the digital euro in offline scenarios.

Transaction management. This task comprises all activities related to settlement, payment or funding, and defunding. The specific tasks are explained in the following chapter.

Settlement. This task refers to all activities related to the settlement of digital euro transactions. The main functions are to maintain the digital euro ledger and to perform settlement verification and settlement recording tasks.

Payment or funding. This task includes all functions related to payments that are not included in the settlement, such as transaction initiation, authentication, and validation. Furthermore, it includes all functions related to funding, such as waterfall and reverse waterfall, as well as limit checks.

Defunding. This task refers to all functions related to the exchange of digital euro for commercial bank money. It includes, for example, limit checks and authentication functions.

2.3 Responsibilities split between the Eurosystem and intermediaries

In the second progress report on the investigation phase¹⁷, the ECB clarified the split in responsibilities between the Eurosystem and intermediaries. In short, the Eurosystem states that it will be responsible for all settlement-related and centralised tasks, and supervised intermediaries will be responsible for all end-user-facing tasks. The market research publication¹⁸ of the ECB further elaborates on the responsibilities of each market participant. The following figure illustrates the distribution of responsibilities for each participant as published by ECB ([Figure 6](#)).

The responsibilities will be split between the Eurosystem and the intermediaries. As per the publication by the ECB, the Eurosystem will be responsible for all settlement-related activities as well as the management, onboarding, and supervising of intermediaries. Furthermore, it will take over the responsibility of providing the interfaces for the connection of the digital euro and TARGET services as well as providing the digital euro access gateway for intermediaries.

¹⁷ ECB 2022, Progress on the investigation phase of a digital euro – second report

¹⁸ ECB 2023, Annex 1: Functional and non-functional requirements linked to the market research for a potential digital euro implementation

FIGURE 6. Responsibility distribution between Eurosystem and intermediaries illustrated by BearingPoint as described by ECB¹

¹ ECB 2023, Annex 1: Functional and non-functional requirements linked to the market research for a potential digital euro implementation

INTERMEDIARIES

EUROSYSTEM

User onboarding, offboarding and management	User management	Intermediary onboarding, offboarding and management
	Liquidity management	Liquidity link with intermediaries' DCA
Intermediary – end-user interface	Interface management	TARGET and intermediary digital euro interface
	Data management	Reference data management
Remuneration		Data warehouse
Online reconciliation and offline settlement	Offline	Fraud and risk management
Wallet lifecycle management		Post-settlement
Executing transactions and validating payments		
Authentication of customers	Transaction management	Settlement verification, recording and reporting
Post-settlement processes		

The Eurosystem will manage all issuance, redemption, funding, and defunding activities and link the central bank accounts of intermediaries for the digital euro. Lastly, the Eurosystem will take over the responsibility of the management of anonymised transaction data, which will be provided for each intermediary.

As per the publication by the ECB, the supervised intermediaries will be responsible for the user management for both private individuals and legal entities as well as for providing and managing digital euro wallets for end-users and enforcing holding limits for the digital euro. In offline scenarios, supervised intermediaries take over the responsibility of the Eurosystem for managing the settlement process by enabling the devices of the end-user to store settlement information

in local storage. However, once the devices are online again, these settlements will be transmitted to the Eurosystem for settlement synchronisation purposes. Furthermore, supervised intermediaries will be responsible for providing the interface for end-users to participate in the digital euro ecosystem. This can be done, for example, by providing a dedicated digital euro app or integrating the digital euro services into the existing app infrastructure. To allow end-users to acquire the digital euro, supervised intermediaries will be responsible for distributing the digital euro using manual and automatic exchange processes. To ensure secure payments, they will pre-validate and authenticate end-user transactions. Once successfully pre-validated, they will also initiate the transaction with the Eurosystem.

2.4 Potential intermediaries participating in the ecosystem

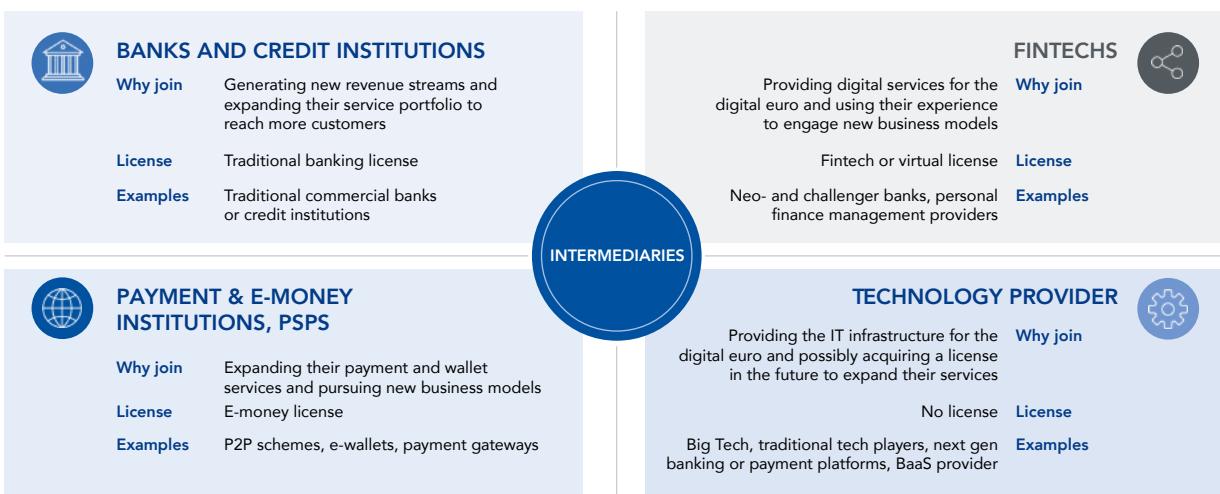
The current assumption is that only supervised intermediaries will be performing the tasks described in the paragraph above. However, this does not mean that each supervised intermediary has to perform all of these tasks, but rather that they can be distributed across different parties. The following provides an overview of potential actors, who could take on the role of supervised intermediary (**Figure 7**).

Banks and credit institutions are already performing most of the tasks mentioned above in the context of their banking activities. Since they hold a traditional banking license, they are in a position to potentially take on the tasks relevant to the digital euro. By participating in the digital euro ecosystem, they could expand their service portfolio for their customers.

Fintechs hold a fintech or virtual license, or an extended license to partner with a parent bank and operate under their license. As their services already focus on digital customer experiences, they are primed to provide services for the digital euro. Therefore, participating in the digital euro ecosystem would allow them to use their experience and engage in new business models.

Payment institutions, payment service providers, and e-money institutions are specialised in offering payment services or currency exchange services as well as issuing payment cards or digital e-wallets. However, they are not operating as a bank, managing deposits, or providing lending or overdraft services. They operate using an e-money license or join forces with a partner bank to operate under their license. This type of supervised intermediary can join the digital euro ecosystem to extend, for example, their payment services or wallet services. For instance, they can draw from experiences gathered from

FIGURE 7. Overview of potential stakeholders in the digital euro ecosystem



existing payment operations to provide a seamless payment experience for end-users. Joining the ecosystem would potentially allow them to pursue new business models.

Technology providers are not operating under any banking license and, currently, are not supervised intermediaries. They are primarily providers of the IT infrastructure needed for the digital euro. This includes the server infrastructure, payment gateways, and interfaces for connecting different actors as well as the infrastructure needed for end-user interaction, e.g., POS systems. However, they might have an interest in acquiring a (banking) license to extend their services in the future.



3. STRATEGIC OPTIONS FOR BANKS

Banks should decide how to strategically approach the introduction of the digital euro if it becomes a reality. How much effort will be needed to provide digital euro services will depend on these strategic decisions and differ from one organisation to the next. Options range from simply ensuring compliance to expanding the business model and tapping into yet unused potential.

The following illustration provides a summary of the strategic options for banks. The first key assumption is that intermediaries will have to provide access to the digital euro ecosystem for end-users and therefore have to act on the digital euro initiative. The second key assumption is that each end-user will be allowed to have one and only one digital euro account. The third key assumption is that the risk for commercial banks of losing deposits, the cheapest source of funds today, when commercial bank money is exchanged into digital euros is mitigated by the Eurosystem by the introduction of safeguards

limiting the holding of digital euros. While the use of the digital euro would likely build up gradually, such safeguards should be provided from day one. In the future, the digital euro would enable residents, in the event of tensions in the financial system, to convert their bank deposits into central bank money in seconds with a few mouse clicks. This poses a risk for banks as they might encounter severe liquidity problems due to rapid outflows of deposits ([Figure 8](#)).

3.1 Option 1: "Ensure compliance" – minimal investment to comply with regulatory requirements

Scenario. The overall goal here is to ensure compliance with regulatory requirements with minimal investment. The digital euro is not an integral part of the product and service portfolio from the launch. However, once it reaches critical mass in the market, products and services may follow suit.

FIGURE 8. Overview of strategic options for banks

OPTION 1: ENSURE COMPLIANCE	OPTION 2: ABSORB AND ADAPT	OPTION 3: EXPAND BUSINESS
SCENARIO Meeting regulatory requirements with minimal investment	SCENARIO Developing additional services as the digital euro is seen as a hygiene factor	SCENARIO Digital euro services are seen as a new pillar of the business model
MOTIVATION Banks are mandated to provide access to their customers	MOTIVATION Customer expectations and demands and the risk of losing customers	MOTIVATION Unlocking new business opportunities and entering new markets
ACTIONS Seeking ways to monetise the digital euro to cover implementation costs	ACTIONS Analysing the impact of the digital euro on existing revenue streams	ACTIONS Market research for the digital euro services and early experimenting
RISKS Cannibalisation of other forms of payment the bank offers	RISKS Eroding existing revenue more than generating new revenues	RISKS Investments might not pay off

Motivation. Assuming banks are mandated to provide access to the digital euro to their customers, they have no choice but to implement digital euro processes. Meeting regulatory requirements could be done with minimal investment; this is an option for banks not wanting to make major investments into development processes for additional services before launch of the digital euro when customer adoption rates are still uncertain. After the launch when adoption rates are foreseeable, the product and service portfolio can be extended to reach more end-users.

Actions. Banks are advised to analyse the minimum requirements and examine how they can fund the implementation of the digital euro and leverage existing investments. For example, functions such as onboarding, fraud protection, and customer support that are already in place for other payment methods today, could be extended. Furthermore, cost savings might be realised due to reduced maintenance costs of other schemes and networks (e.g., decommissioning parts of the ATM network).

Risks. The digital euro could be seen to cannibalise other payment products a bank offers, while at the same time providing fewer opportunities for revenue generation than those existing products. Customers could potentially switch from existing payment products to the new digital euro services, thus, resulting in a shift in revenues. Furthermore, there is a risk that solely focusing on being compliant might open possibilities for other intermediaries to take the lead in more comprehensive service offerings. As a result, a bank's customers may have decided which provider to choose for their digital euro account before the bank's service portfolio is fully launched. Therefore, banks opting for the minimal approach might lose the customer interface for the digital euro.

3.2 Option 2: "Absorb and adapt" – seek synergies to enhance the existing revenue business

Scenario. The goal of this option is to develop specific services for the digital euro. Potentially, the digital euro could lead to the decommissioning of existing products as it is envisioned to be an integral part of the overall service offering and is marketed to customers actively. The assumption is that the digital euro is seen as a hygiene factor by customers, meaning that customers expect their banks to offer access to the digital euro.

Motivation. Instead of being motivated by regulatory requirements, the motivation comes from customer expectations and demand. Banks can seek to create synergies with existing products and services, enhance existing revenue streams, and try to create new ones. The increase in customer demand and expectations might also be a factor leading banks to consider an integration strategy. Furthermore, banks might be motivated by the fear of losing existing customers as the number of digital euro accounts for each customer is limited to one.

Actions. Banks are advised to analyse their current product and service portfolios and the impact the digital euro will have on their cost base. This also includes a review of the existing business strategies to identify the potential the digital euro could unlock, if any. Furthermore, to achieve the goal of cost savings, it is advised to actively look for cost-cutting potential. It is also advised to actively analyse the current processes for synergy effects that may result in improved profitability and potentially open up new revenue streams. To design customer-centric processes, it is advisable to conduct market research on customer attitudes and expectations with regard to the digital euro as well as the definition of problems the digital euro would solve. Based on this research, use cases

for customers and a fit-for-purpose customer experience can be designed.

Risks. As described above, building new services for the digital euro poses the risk of eroding existing revenues rather than generating new revenues. At the same time, making large investments in the development of digital euro services before the launch comes with the risk of not generating enough revenues to break even. However, banks also run into the risk of making too few investments, resulting in products and services not being suitable for customer demand.

3.3 Option 3: "Expand business" – Seek completely new business opportunities

Scenario. The digital euro is viewed as a new business opportunity. Existing products and services are not only expanded, but the goal is to seek completely new opportunities and create new revenue streams enabled by the digital euro. Digital euro services are seen as an additional pillar in the already existing business model.

Motivation. In this scenario, the motivation is neither complying with regulatory requirements nor seeking synergies with existing services. Instead, it derives from unlocking new business opportunities and entering new markets. The digital euro is seen as an opportunity to attract new customers and generate new revenue streams. In addition, revenue streams from other products and services might be improved. The infrastructure that needs to be implemented now could potentially be opened up in the future allowing for additional opportunities in form of automated and programmable payment options.

Actions. As the digital euro is envisioned to be an additional pillar in the business model, banks are advised to do extensive market research on customer expectations and track overall market movements on digital euro topics. In combination with early experimentation and prototyping, banks following this strategy can lead the industry in the digital euro service ecosystem. As a result, a customer centric solution can be designed and developed. It is advisable to engage customers early by offering educational material on what the digital euro is. Furthermore, reviewing the product and service portfolio to identify the impact of implementing the digital euro in terms of product competition and revenue development is recommended. Moreover, it is recommended to educate stakeholders early on in the digital euro journey and to engage in discussions with them to generate ideas regarding the opportunities the digital euro enables.

Risks. Developing a new pillar for the business model is a risky undertaking. Considering the uncertainty of the realisation and of the success of the digital euro, the investment might not pay off. Furthermore, risks of the erosion of existing revenue streams and replacement of existing products and services must be considered. High competition from existing actors as well as new actors entering the market is to be expected.

4 WAYS FORWARD FOR THE BANKING INDUSTRY

The question of how banks should engage in the topics surrounding the potential introduction of the digital euro remains. The following section elaborates options for involvement for banks (**Figure 9**).

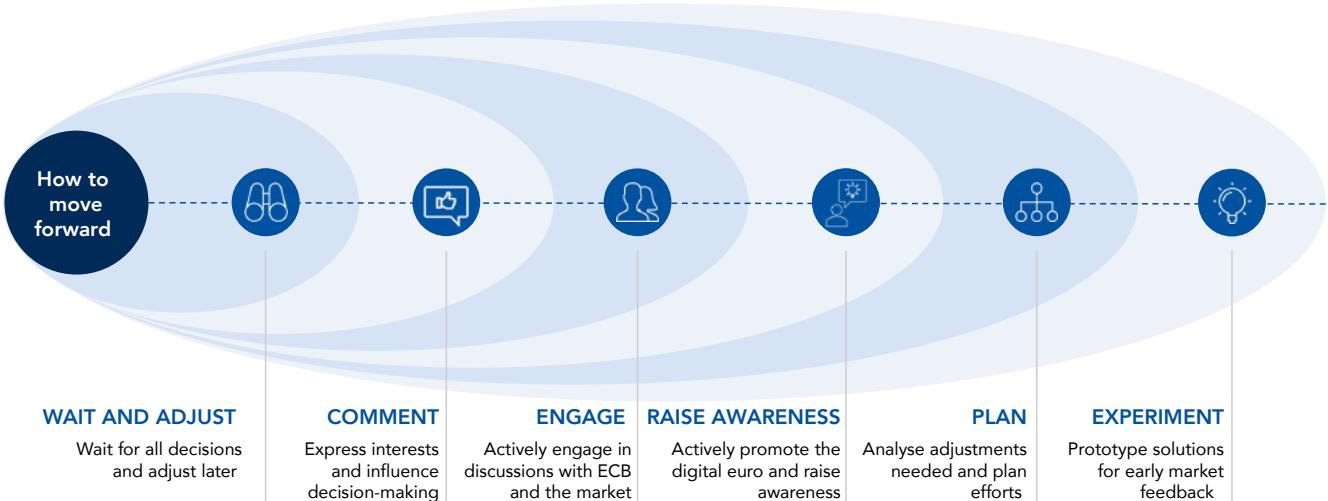
Wait and adjust. Banks can wait until the most important decisions are made by the Eurosystem. Subsequently, they can adjust their plans and strategies according to the changes made. This approach, however, does not allow for active engagement and influence in the decision-making process.

Comment. Banks can continue commenting on ECB and market publications. By doing so, they can express their interests and influence decision making to some degree.

Engage. Banks can continue to engage in the exchange with the ECB and the market by actively participating in market research of private institutions, selected conferences by the central banks, or in the digital euro rulebook development. In this way, they have a direct impact on design decisions made by the ECB, and thereby the emerging digital euro ecosystem as well as the resulting business opportunities.

Raise awareness. Banks can continue raising awareness for the digital euro in the market as well as within individual organisations. On the one hand, this allows for early customer interaction and mobilisation. On the other hand, it allows for preparing the individual organisations for the coming changes while raising awareness at the level of the senior management.

FIGURE 9. Overview of engagement options for the banking industry illustrated by BearingPoint



Plan. Banks can start planning individual efforts and analyse adjustments needed early on for the potential introduction of the digital euro. By doing so, a bank is prepared to start the adaptation phase once all decisions have been made by the ECB. Furthermore, delays resulting from time-consuming assessments for adjustments needed can be prevented. Thus, starting the planning phase early ensures a timely adaptation following the official launch.

Experiment. Banks can start prototyping solutions. This approach allows for early market feedback, and therefore, a better experience and a competitive advantage. This approach also provides insights on the time needed for full inhouse adaptation and deployment.



5. CONCLUSIONS

The digital euro is an ambitious European project. It will expand the group of entities that have access to central bank money and related settlement mechanisms as new types of intermediaries can be expected to join the digital euro ecosystem. The implications for banks and their product portfolios can be significant (**Figure 10**).

However, there are still a lot of uncertainties regarding the digital euro. Some design choices have not been finalised yet, meaning that success factors and their potential for the banking industry remain unknown as well as what business value the project will have for banks. The longer these uncertainties persist, the longer banks are unable to assess the impact the digital euro will have on their business. To mitigate these uncertainties, banks would be well advised to be proactive in investigating the potential impact of the digital euro on their business and should have a strategy in place on how to approach the digital euro once the decision on its launch is made.

Furthermore, the concerns of banks outlined in this report should be kept in mind during the design of the digital euro. Smart payments and programmability should be considered for implementation in the future as they open up new business opportunities for the financial industry and could deliver real benefits for end-users as well as banks. Furthermore, a digital euro solution for business-to-business payments is an option that should be analysed for future use to meet industry demands.¹⁹

¹⁹ Representatives of the German Industrial Association (BDI, Bundesverband Deutscher Industrie) have emphasised the importance of such a functionality and its benefits for the producing industry. Therefore, German commercial banks are already looking into providing such functionalities to industry members utilising commercial bank money tokens (CBMT) as representatives from the German Banking Industry Committee (GBIC) expressed during the working group discussions and outlined in their working paper (Die Deutsche Kreditwirtschaft 2022, Working Paper on Commercial Bank Money Token, https://die-dk.de/media/files/20221206_GBIC_Working_Paper_on_Commercial_Bank_Money_Token_V1.3.pdf)

FIGURE 10. Main takeaways for banks going forward

01



Banks are advised to mitigate uncertainties of the digital euro design by proactively investigating its impact on their business.

02



Banks are advised to continue collaborating with other ecosystem participants to actively influence the decision making and leverage potential network effects.

03



Banks are advised to have a strategy in place on how to approach the digital euro at launch and are advised to define it now, if not yet done.

APPENDIX A: GLOSSARY OF TERMS

Central Bank Money

Central bank liabilities, in the form of either banknotes, bank deposits, wholesale CBDC, or retail CBDC held at a central bank, which can be used for settlement purposes.

(European Central Bank)

Commercial bank money

Commercial bank liabilities that take the form of deposits held at a commercial bank which can be used for settlement purposes.

(European Central Bank)

Central bank digital currency (CBDC)

A CBDC is a digital form of central bank money that is widely available to the general public. “Central bank money” refers to money that is a liability of the central bank.

(Federal Reserve)

Retail central bank digital currency (rCBDC)

A digital central bank liability offered to the general public (e.g., citizens, businesses, and government entities) for retail payments.

(European Central Bank)

Wholesale central bank digital currency (wCBDC)

A digital central bank liability used by eligible entities (usually banks) for wholesale payments.

(European Central Bank)

Synthetic central bank digital currency (sCBDC)

A digital asset issued by private firms (e.g., not by a central bank) and backed by corresponding central bank liabilities. It is therefore not a CBDC but a stablecoin, which is a form of a crypto asset the value of which is tied to the value of other assets, such as one or more national currencies or other financial assets.

(European Central Bank & Riksbanken)

Crypto asset

An asset recorded in digital form and enabled using cryptography that is not and does not represent a financial claim on, or a liability of, any identifiable entity.

(European Central Bank)

A digital representation of a value or a right which may be transferred and stored electronically, using distributed ledger technology or similar technology

(MiCA)

Digital euro

A retail central bank digital currency (rCBDC) that the Eurosystem may issue in the future.

(European Central Bank)

Retail payments

A non-time-critical payment of relatively low value. These payments are typically initiated by and made to individuals and non-financial institutions. Antonym: large-value payment

(European Central Bank)

Large-value payments / wholesale payments

A payment, generally of a very large amount, which is mainly exchanged between banks or between participants in the financial markets and usually requires urgent and timely settlement.

(European Central Bank)

Business-to-business (B2B) payment

A transfer of funds from one business customer to another.

(European Central Bank)

Money

An asset accepted by general consent as a medium of exchange. It may take, for example, the form of coins or banknotes, or units stored on a prepaid electronic chip card. Short-term deposits with credit institutions also serve the purpose of money. In economic theory, money performs three different functions: (1) a unit of account; (2) a means of payment; and (3) a store of value. A central bank bears the responsibility for the optimum performance of these functions and does so by ensuring that price stability is maintained.

(European Central Bank)

Currency in circulation

Banknotes and coins in circulation that are commonly used to make payments.

(European Central Bank)

Distributed ledger technology (DLT)

A family of technologies aiming to solve the problem of reaching a consensus between participating entities, which is required for validating and recording data in multiple places (e.g., in the distributed ledger) without relying on central coordination.

(European Central Bank)

Blockchain

A type of distributed ledger technology in which transactions are validated and recorded in a distributed ledger in separate but connected batches known as blocks.

(European Central Bank)

E-Money

A monetary value, represented by a claim on the issuer, which is:

1. stored on an electronic device (e.g., a card or computer)
2. issued upon receipt of funds in an amount, not less in value than the monetary value received
3. accepted as a means of payment by undertakings other than the issuer.

(European Central Bank)

Legal tender

A means of payment whose acceptance is mandatory by default (i.e., unless its acceptance is restricted for reasons of public interest or waived by contractual agreement), at full face value, for the discharge of payment obligations

(European Central Bank)

Cryptocurrency

A new type of asset recorded in digital form and enabled using cryptography that is not and does not represent a financial claim on, or a liability of, any identifiable entity.

(ECB Crypto-Assets Task Force)

Digital currencies created in the private sector that are not backed by a state or central bank. Central banks generally refer to cryptocurrencies as crypto assets because they usually do not fulfil the basic functions of money.

(Riksbank)

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