

Progress on the preparation phase of a digital euro

First progress report

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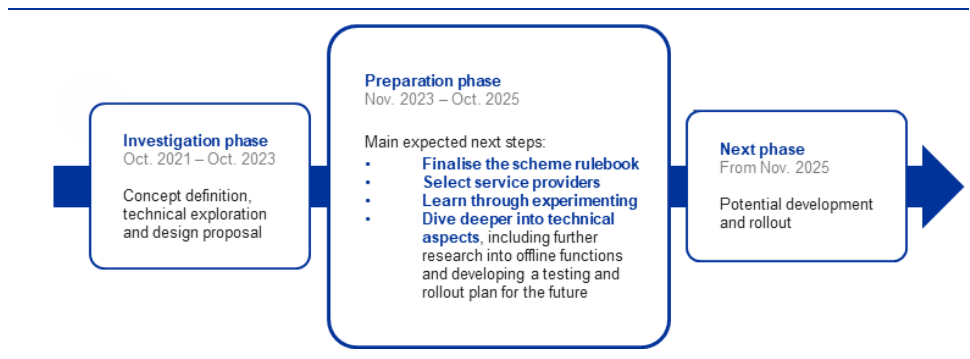
Introduction

The Eurosystem's digital euro project aims to ensure central bank money evolves alongside current payment preferences and trends, as well as to facilitate electronic payments everywhere in the euro area and strengthen Europe's strategic autonomy. A digital euro would be a digital means of retail payment issued by the Eurosystem – which consists of the European Central Bank (ECB) and the national central banks of the euro area – available to everyone in all retail payment scenarios, across the entire euro area. It would complement cash, offering individual users more freedom of choice by providing a secure and accessible payment solution. A digital euro would also strengthen Europe's monetary sovereignty and reduce our dependence on the large, non-European private payment providers that currently dominate the European landscape.

Following the completion of the digital euro investigation phase launched by the Eurosystem in 2021, on 18 October 2023 the Governing Council of the ECB approved the launch of a two-year preparation phase. The aim of the preparation phase, which will last until 31 October 2025, is to build on the findings of the previous phase¹ and lay the foundations for the potential issuance of a digital euro. It involves finalising the digital euro rulebook (by defining a single set of rules to be applied to payments in digital euro) and selecting providers that could potentially develop a digital euro platform and infrastructure. As part of this phase, the Eurosystem is also carrying out further testing and experimentation and a deeper dive into technical aspects of the digital euro, such as its offline functionality and a testing and rollout plan.

¹ See [A stocktake on the digital euro – summary report on the investigation phase and outlook on the next phase](#), ECB, October 2023.

Figure 1
Overview of digital euro project phases



As the digital euro is a common European project, the Eurosystem’s technical work during the preparation phase is being carried out in parallel with the legislative process being conducted by co-legislators. The ECB’s continued technical progress during the preparation phase is helping to better inform the legislative process as the European Parliament and the Council of the European Union discuss the proposal tabled by the European Commission in June 2023.² Moreover, the ECB’s regular exchanges with stakeholders, including the public, are helping to ensure that a digital euro meets the highest standards of quality, security, privacy and usability.

By the end of 2025, the Governing Council will decide whether to move to the next phase of preparations for a digital euro. The decision on whether to issue a digital euro will only be considered by the Governing Council once the European Union’s legislative process has been completed. The ECB will consider any adjustments to the design of the digital euro that may become necessary as a result of the legislative deliberations.

Against this background, this report outlines the progress of the digital euro project since the start of the preparation phase. It presents the results of the technical work conducted in the following areas: privacy, the digital euro’s offline functionality, and the rulebook. In addition, it summarises the technical input provided by the ECB to support the legislative efforts of European Union legislators.

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Guaranteeing digital euro user privacy

Privacy has been integral to the digital euro project from the beginning, in line with the “privacy by design” approach.

The privacy and data protection of digital euro users have been fundamental to the project from the beginning, in line with the “privacy by design” approach. The public consider privacy and data protection to be two of the most important

² See [Proposal for a Regulation of the European Parliament and of the Council on the establishment of the digital euro](#), COM(2023) 369 final, 28 June 2023.

design elements of a digital euro³, which is why the Eurosystem has prioritised these aspects at every stage of the project.⁴

Only the payer and the payee would know the personal transaction details of offline digital euro payments.

The design of the digital euro includes an offline functionality that would offer users a cash-like level of privacy, both for person-to-person payments and payments in physical shops. As detailed in section 3, the use of digital euro for offline payments would not involve sharing personal transaction data with payment service providers (PSPs), the Eurosystem or any potential providers of supporting services.

Online digital euro transactions would be at the technological forefront when it comes to privacy.

For online digital euro payments, privacy would be implemented in such a way that the Eurosystem itself – the issuer and payment infrastructure provider – would not be able to directly link transactions to specific individuals. The ECB, with support from market experts and Eurosystem technical experts, has been exploring the technological solutions required to achieve this, including the following specific measures: pseudonymisation⁵, hashing⁶, and encryption of messages exchanged with and between PSPs. Moreover, the data exchanged between PSPs and the Eurosystem would be segregated. As a result, the Eurosystem would not be able to directly identify end users or link any of the data it processes to an identified end user.⁷ This feature in itself provides higher privacy and data protection than typically provided by current commercial solutions.⁸ The Eurosystem is committed to remaining at the forefront of privacy-enhancing technologies, and as such continuously assesses new methods that might be feasible and effective for the digital euro.

As for PSPs, they would only have access to online digital euro transaction details to the extent necessary to ensure compliance with EU law, such as anti-money laundering rules, in line with the Commission's legislative proposal. The user's explicit consent would still be required in order for their data to be used for any other commercial purposes and additional services. The digital euro scheme rulebook (see section 4) will need to ensure that users are given the chance to make informed decisions and are not forced to accept the processing of their

³ See [Study on Digital Wallet features](#), Kantar Public, March 2023.

⁴ See also [Making the digital euro truly private](#), The ECB Blog.

⁵ Pseudonymisation is a process used to protect personal data by removing identity attributes and replacing them with fictitious ones. This means that the data can still be analysed and used for certain purposes, but are not directly traceable back to the individual to whom they originally referred. This process allows personal identities to be hidden, thereby enhancing privacy while maintaining the usefulness of the data in the processing of transactions.

⁶ Hashing is a process used to convert data into a fixed-size string of characters, typically a sequence of numbers and letters. For instance, by using a hash function, a short text like "hello" can be transformed into an output hash like "2cf24dba5fb0a30e26e83b2ac5b9e29e1b161e5c".

⁷ This is also confirmed by Recital 76 of the proposed Regulation: "The European Central Bank and national central banks may process personal data in so far as it is necessary to fulfil tasks that are essential to the proper functioning of the digital euro. [...] The European Central Bank and national central banks would process personal data for these tasks using state-of-the-art security and privacy-preserving measures, such as pseudonymisation or encryption, to ensure that data cannot be used to directly identify a specific digital euro user."

⁸ It is common practice for the central operator (i.e. infrastructure provider) to process large volumes of transaction information. This typically includes end-user identity attributes such as names, addresses and phone numbers, as well as the user's transaction remittance data (possibly containing special categories of personal data) and account balances. This information would enable the central operator or anyone accessing its data to link payments to an identified end user.

personal data (beyond what is necessary for compliance with the proposal) in order to use basic digital euro services.

The Eurosystem would put in place strong rules to protect user information and would in turn be supervised by independent data protection authorities.

These authorities would make sure all actors involved in the digital euro scheme complies with the rigorous standards of the European Union Data Protection Regulation (EUDPR)⁹ and the General Data Protection Regulation (GDPR)¹⁰, the strongest privacy and security laws in the world. European co-legislators will ultimately set out the framework and decide on the balance between privacy and other public policy objectives, such as countering money laundering and illegal activities.

Effective fraud detection and prevention is crucial to ensuring trust in a digital euro.

When designing a digital euro, the Eurosystem also needs to ensure that the implementation of privacy measures still allow for robust end-user protection against fraud. Fraud detection and prevention is a key demand by consumers and retail organisations and is crucial to ensuring trust in a digital euro. To gain additional expertise and knowledge on anti-fraud technologies under development, the ECB has, together with industry experts, assessed ongoing and past research in this field. The analysis shows that current technologies are capable of working with pseudonymised end-user information to ensure effective fraud detection and prevention. Alongside the general fraud detection and prevention mechanism¹¹, PSPs would conduct need to do fraud checks, as they currently do for digital payments.

3

An offline digital euro

The offline functionality of a digital euro would allow users to pay without an internet connection after pre-funding their digital euro account via the internet or an ATM.

A digital euro would be available for both online and offline use and could be used for person-to-person payments as well as in physical shops. The offline functionality would enable payments to be made without an internet connection, for example at close range, in locations with limited network coverage, and in the event of power cuts. To use this feature, users would have to pre-fund their digital euro account via the internet or at a designated ATM. The payment would be validated directly by two offline devices – e.g. mobile phones or payment cards – belonging to the two parties involved in the transaction, without the need for a centralised system or third party. Transaction data would not be sent through a network but would remain on the two devices used for the transaction, thereby protecting user privacy.

The offline functionality involves technological, security, and operational aspects. For that reason, the ECB has intensified its efforts to investigate the

⁹ Regulation (EU) 2018/1725 of the European Parliament and of the Council of 23 October 2018 on the protection of natural persons with regard to the processing of personal data by the Union institutions, bodies, offices and agencies and on the free movement of such data (OJ L 295, 21.11.2018, p. 39).

¹⁰ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data (OJ L 119, 4.5.2016, p. 1).

¹¹ This mechanism would support PSPs in identifying fraudulent transactions by supplementing their individual fraud risk view with insights on patterns and anomalies from a central infrastructure-level perspective.

deployment of the digital euro's offline functionality in end users' devices in accordance with the requirements set out in the draft legislative proposal.

For mobile phones, delivery of the offline functionality is contingent on access the near-field communication (NFC) antenna and the secure element. NFC provides a highly convenient end-user experience which consumers in the euro area are already familiar with. The ECB has been looking at the modalities of accessing the hardware component ("secure element"¹²) in mobile devices and smart cards to allow settlement of transactions in end users' devices. There are technical tools on the market which allow applications to be deployed remotely on the secure elements of mobile devices. These tools are commonly used for identification, telecommunications and transport purposes and could be used to deploy the offline digital euro solution too, allowing users to easily download it and use it on their mobile devices without having to go to a bank branch to verify their identity.

The effective implementation of an offline digital euro on mobile devices will ultimately depend on the requirements laid down for equipment manufacturers and providers of electronic communication services in the legislation.

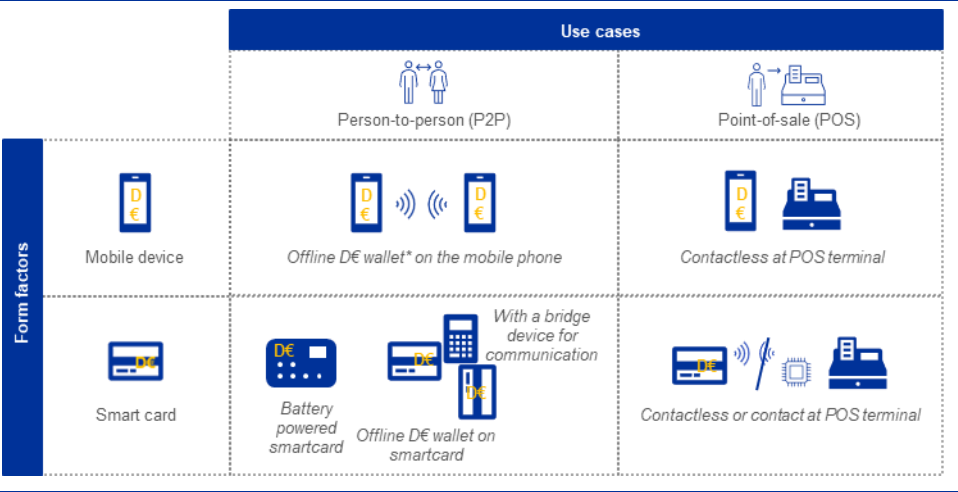
Any reliance on the physical specifications of users' mobile devices to access and use digital euro offline will depend on the outcome of the legislative discussion around the digital euro. According to Article 33 of the current Regulation, equipment manufacturers and providers of electronic communication services should grant effective access to the secure element installed in users' devices. This would allow people to use their mobile devices to pay offline in digital euro, which is crucial to ensuring inclusive access to digital euro payments. There should also be sufficient unused storage on the secure element for it to function as the local storage device for the digital euro's offline functionality.

In parallel, the ECB has also been investigating alternative form factors for an offline digital euro, for example battery-powered smart cards and non-powered smart cards which use a "bridge-device"¹³ to connect. The insights gathered thus far on an offline solution and access to the secure element have been taken into account in the scope of the calls for applications (see section 5).

¹² A secure element is a microprocessor chip that protects sensitive data by providing tamper-resistant storage and processing of cryptographic keys and other security-critical information.

¹³ A "bridge device" is a simple, pocket-sized, battery-powered device for establishing a connection channel between two non-powered smart cards, enabling transactions between them. At a minimum, this device should have: i) a user interface (e.g. screen and keypad), ii) communication capabilities, iii) card reader and near-field communication capabilities, and iv) a small battery.

Figure 2
 Overview of offline digital euro use cases and potential form factors



The ECB has also assessed other essential aspects of offline digital euro payments, with a view to making them seamless, secure, and user-friendly. In particular, its technical work has focused on delivery considerations and how to fund and defund offline digital euro wallets, including how to perform anti-money laundering and forgery checks during the funding and defunding processes. It is essential to ensure that any funds recirculated within the digital euro system are genuine, and to detect and prevent any instances of double spending and fraudulent currency.

These insights on the offline functionality, its use cases and its key features were shared with European co-legislators and the market. The project team participated in a dedicated technical seminar with the Council Working Party of the EU Council and presented its analysis in the [status update](#) of the Euro Retail Payments Board (ERPB¹⁴) in April. Work on the offline functionality of the digital euro will continue in the coming quarters.

4 The Rulebook Development Group has drafted a first version of the rulebook and is working on the remaining sections with new workstreams launched in May 2024.

The digital euro rulebook

A digital euro would be the first public, digital means of payment to provide pan-euro area reach. To make this technically possible, a single set of rules, standards and procedures to standardise digital euro payments across the euro area is being developed: the digital euro rulebook. A common rulebook is necessary to ensure that digital euro payments are accepted throughout the euro area, just like cash payments, and work in a harmonised way. It will allow intermediaries to use its open standards to have immediate access to all markets beyond their domestic borders.

¹⁴ The Euro Retail Payments Board (ERPB) is a high-level strategic body tasked with fostering the integration, innovation and competitiveness of euro retail payments in the European Union. The ECB engages with its member associations in dedicated technical sessions on digital euro.

The scheme rulebook is being developed by the Rulebook Development Group (RDG). The RDG was established in January 2023 and consists of representatives from the Eurosystem central banks and the European retail payments market, including consumers, retailers and intermediary associations. **RDG members** have nominated experts for dedicated workstreams on topics requiring particular expertise, with the aim of defining the role and requirements of all actors involved in a digital euro ecosystem.

In January 2024, the ECB published a summary of the first draft version of the rulebook produced by the RDG.¹⁵ This draft version underwent an interim review by the RDG, which was completed at the end of April 2024 and covered: (i) the functional and operational models for a digital euro, including the end-to-end flows elaborating how all use cases and services would function; (ii) the technical scheme requirements depicting the high-level architecture and standards which should be considered for a potential digital euro landscape; and (iii) an initial version of the adherence model setting out the rights and obligations of scheme members in accordance with the draft legislation.¹⁶

Seven new workstreams of the RDG have been established to help finish the first complete draft version of the rulebook. **Calls for candidates** were issued for each of these new workstreams, inviting leading experts in payments infrastructure and architecture, technical specifications and scheme management to apply. The workstreams will report to the RDG and will help draft the sections of the digital euro rulebook that cover the following aspects:

1. The minimum user experience (UX) standards with regard to the functional and operational models, as well as the implementation of a digital euro.
2. The testing and certification of payment and acceptance solutions, as well as of the end-to-end payment flows.
3. Risk management, including identifying inherent risks for different digital euro actors, proposing ways to mitigate them, and determining the related residual risk.
4. Implementation specifications, divided as follows:
 - (a) Interactions between payment and acceptance solutions of individual users' devices (apps, cards, etc.) and business users' acceptance devices (e.g. terminals, websites, apps, ATMs).
 - (b) Interactions between individual users and intermediaries.
 - (c) Interactions between business users and intermediaries.

¹⁵ See [Update on the work of the digital euro scheme's Rulebook Development Group](#), ECB, January 2024.

¹⁶ For more information, see *ibid.*

- (d) Interactions between the digital euro service platform (settlement services, fraud and risk management services, dispute management services, alias lookup services, etc.) and intermediaries.

The next draft version of the rulebook will be delivered by the end of the year.

A new progress report on the RDG's work will be published beforehand, by the third quarter. The text of the rulebook will reflect the outcome of the digital euro legislative process.

5

Selecting providers for digital euro components

The ECB will select providers for digital euro components from the respondents to five calls for applications launched in January 2024.

The design of a digital euro would rely on state-of-the-art technologies that would create a cyber-resilient and future-proof environment. On 3 January 2024, the ECB published [five calls for applications](#), inviting external providers¹⁷ to tender for the following digital euro components: the alias lookup component (to enable end users to pay and be paid in digital euro through an account alias, which is a unique pseudonymous identifier – see section 2 on privacy), the fraud and risk management component, the app and software development kit, offline services, and the secure exchange of payment information component. In parallel, the Eurosystem will prepare to internally develop digital euro components for functionalities like settlement, access management and reference data management.

This selection process will inform the final decision on the technical choices for a digital euro design. It will be fundamental to establishing framework agreements with the most suitable providers and preparing to develop a digital euro, should this decision be taken in the future by the Governing Council of the ECB. These agreements are not in any way a commitment to initiate development, but are simply a preparatory step to ensure the Eurosystem's readiness should the development and implementation of a digital euro be warranted in the future. They include safeguards that provide for the possibility to adjust their scope if required, for example to reflect the outcome of the current legislative deliberations.

6

Other aspects related to the digital euro design

6.1

Methodology for the definition of holding limits

In order to maintain a resilient financial environment, the ECB would limit the amount of digital euro people could hold in their accounts.

The Eurosystem is fully committed to ensuring that the introduction of the digital euro is consistent with a resilient financial environment that allows its monetary policy to be transmitted effectively. Digital euro holdings of individuals

¹⁷ Only companies that are registered in the EU will be eligible to participate in the procurements. Moreover, these companies cannot be under the control of or owned by non-EU companies. Additional criteria, as detailed within the call for applications, ensure that potential providers will have the necessary capabilities, size and stability to become long-term partners of the Eurosystem, helping it launch and maintain a digital euro in full strategic autonomy.

would not be remunerated and would be subject to holding limits, as provided for in the Commission's legislative proposal.¹⁸ These holding limits are intended not to prevent the digital euro from being a store of value altogether but rather to moderate its use in this capacity, and thus preserve the role of banks in ensuring the efficient provision of credit to the real economy.¹⁹ In any case, users would have the option to link their digital euro wallet with a commercial bank account, allowing them to make payments through their digital euro wallet without needing to pre-load it with funds. This setup would enable large payments to be made with digital euro, irrespective of the digital wallet's current balance.²⁰ In addition, this functionality would permit the receipt of payments exceeding the set holding limit.

The setting (i.e. “calibration”) of the holding limit will entail striking a balance between an optimal user experience and the need to maintain price stability and financial stability. Although the holding limit for the digital euro would be set closer to its possible launch date (to ensure it reflects the economic conditions at that time), the ECB has started work on a calibration methodology, which entails a comprehensive monetary and economic assessment aimed at balancing the objectives set out in the draft legislation: to make the digital euro a widely used means of payment and to protect financial stability and the transmission of monetary policy. A dedicated workstream involving ECB experts, with support from the national central banks and national competent authorities, has begun identifying the key factors influencing calibration and defining a coherent methodology that takes these factors into account. The assessment will include an analysis of the possible impact of the digitalisation of payments on the demand for banknotes, since banknotes and digital euro would have indistinguishable effects on bank liquidity. The ECB has also launched a data collection exercise with major banks to obtain the granular data required to perform the assessment.

The ECB is committed to maintaining regular exchanges with co-legislators and market stakeholders to provide updates on the progress of the project and gather feedback. The first joint exchange on the calibration of holding limits took place in April via the ERPB [technical session](#) on digital euro, and will be followed by dedicated technical sessions with market stakeholder associations in June.

6.2 Environmental aspects

The ECB will aim to minimise the environmental impact of a digital euro throughout the value chain.

The preparation phase includes a careful analysis of the environmental impact of a digital euro, including the assessment of several measures to minimise this impact. The overall approach includes optimising the entire value chain by avoiding energy-consuming protocols and re-using components whenever possible,

¹⁸ All individuals would have the same holding limit, while businesses and merchants would not be able to hold online digital euro without this constraining their ability to accept digital euro payments.

¹⁹ The aim is to maintain a healthy equilibrium similar to seen with cash. Cash is universally accepted and used for transactions but generally not held in large amounts by individuals for long-term saving due to its physical nature and low security compared with bank deposits. As with cash, holdings of digital euro would not be remunerated.

²⁰ Banks would still be able to impose limits (akin to their daily transaction limits), but in the absence thereof, large payments exceeding the holding limit would be allowed.

as well as adhering to best practices in environmental performance and transparency. To guarantee this, the January 2024 calls for applications include requirements for external providers to consider environmentally friendly design options.

7 Technical input provided in the context of the legislative discussions

Policy-relevant aspects are discussed regularly at the European level with the European Parliament and with euro area finance ministers in the context of the Eurogroup. Eurogroup members²¹ and Members of the European Parliament²² have both expressed support for a digital euro. Executive Board member [Piero Cipollone presented an update on the digital euro project](#) on 14 February 2024 during a dedicated hearing before the Committee on Economic and Monetary Affairs of the European Parliament. He also [updated Eurogroup members during a dedicated discussion](#) on 11 April.

The ECB has provided further technical expertise in the context of legislative discussions with both the European Parliament and the Council of the European Union. In parallel, it has continued its close cooperation with the European Commission with a view to reviewing, at a technical level, a broad range of policy, legal and technical questions.²³ This section briefly outlines the key areas in which the ECB has offered its expertise and views, summarised in the Opinion adopted by the Governing Council on the legislative proposal published by the European Commission²⁴.

7.1 Number of digital euro accounts per user

The ECB has published a technical analysis looking at the feasibility and implications of having multiple digital euro accounts per user.

Anyone in the euro area would be able to open a digital euro account. During the investigation phase of the project, the Eurosystem's research into the digital euro design found that limiting users to one digital euro account would be easier to implement than allowing multiple accounts per user. On the other hand, the Commission's legislative proposal did not provide for a limit to the number of digital euro payment accounts that users could open with the same or a different bank or payment platform.

²¹ See [Eurogroup statement on the digital euro project](#), Eurogroup, 16 January 2023.

²² See [European Parliament resolution of 16 February 2023 on the European Central Bank – annual report 2022](#), European Parliament, February 2023.

²³ For more information, see [ECB intensifies technical work on digital euro with the European Commission](#), ECB, 19 January 2021.

²⁴ [Opinion of the European Central Bank of 31 October 2023 on the digital euro \(CON/2023/34\)](#).

To support the decision that co-legislators are taking on this matter, the ECB has published an in-depth technical analysis of the feasibility and implications of having multiple digital euro accounts per user.²⁵ The analysis shows that:

- it is technically feasible to provide users with multiple accounts in conjunction with an individual holding limit;
- a multiple account scenario would not have implications for privacy, as it would not require the Eurosystem to process more personal data than in a single account scenario;
- joint digital euro accounts would be possible in both a single account and a multiple account scenario; however, holding a joint digital euro account and an individual digital euro account simultaneously would only be possible in a multiple account scenario;
- unlike the current IBAN system, a digital euro would offer the unique functionality of carrying over, or “porting”, the account number when the user switches from one PSP to another. This would make changing payment service provider as easy as switching from one mobile phone provider to another.

That being said, trade-offs would be necessary, mainly in terms of user experience, as well as technical and operational implementation for PSPs. For instance, a multiple account scenario would lead to a higher degree of complexity: **users would need to go through more steps if they wanted to open an additional digital euro account**, such as allocating their holding limit between their existing and new account(s) for both online and offline payments. PSPs would also need to provide additional customer support and manage requests for opening and closing digital euro accounts. Implementing multiple accounts would require a coordinated effort from PSPs to check for and avoid duplication of holding limits, and in the event that a user’s data (e.g. surname) changes in one of their accounts.

7.2 Compensation model

The compensation model ensures that consumers, merchants and PSPs would all benefit from the introduction of a digital euro.

While the compensation model would ultimately be decided by European co-legislators, the Eurosystem supports a model that creates fair and reliable economic incentives for PSPs, helping them to meet the operational costs of distributing a digital euro. The draft legislation envisages a compensation model with fair economic incentives for all involved (e.g. consumers, merchants, banks), in line with the following principles:

- As a public good, a digital euro would be free of charge for basic use. It would be equally accessible in all euro area countries.
- PSPs would charge merchant fees for providing digital euro-related services to offset the operational costs of distributing a digital euro, as is the case today for

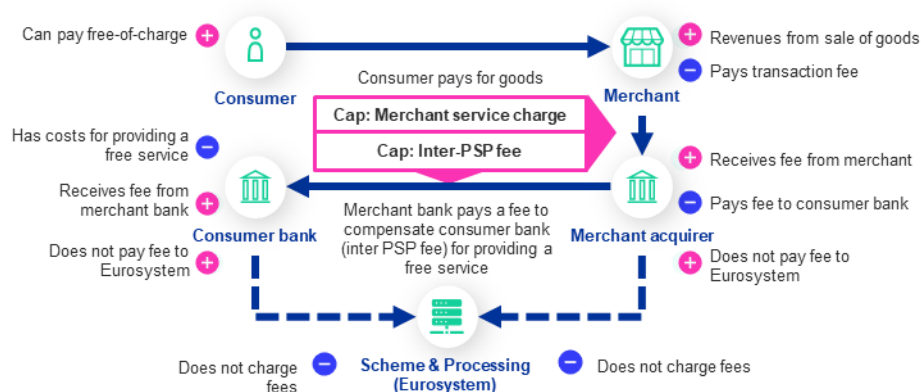
²⁵ See [Technical note on the provision of multiple digital euro accounts to individual end users](#), ECB, 2024. The note was also discussed in a dedicated [session](#) of the ERPB.

other digital means of payment. PSPs would also be able to develop additional digital euro services for their customers, on top of those required for basic use.

- The fees that merchants pay to PSPs for digital euro services would be subject to a cap to provide adequate safeguards against excessive charges, as outlined by the European Commission in its legislative proposal on a digital euro.
- The Eurosystem would bear the issuance costs, as it does in the production of banknotes.

Figure 3

Step by step overview of the digital euro compensation model



Note: This overview reflects the current draft legislation proposed by the European Commission.

In the context of legislative discussions, the ECB has provided technical expertise with regard to analysing the dynamics in the euro retail payments market. The formal responsibility to regulate fees lies with the legislators. The ECB's technical advice can be summarised as follows.

- European payment solutions remain fragmented along national lines, resulting in limited competition at the point of interaction.²⁶
- The lack of competition is particularly pronounced for card payments, which now account for the majority of retail payment transactions in terms of value. According to the most recent data, international card schemes account for close to two-thirds (64%) of all electronically initiated transactions made with cards issued in the euro area and 13 out of the 20 euro area countries rely on them entirely due to the absence of a national card scheme. The share of international card schemes is likely to grow further, as even the largest domestic card schemes are losing market share.

²⁶ See also Cipollone, P., *Innovation, integration and independence: taking the Single Euro Payments Area to the next level*, April 2024.

- Merchants also face significant additional costs due to the limited competition in card payments, as it translates into less choices for payment providers and, in turn, higher fees.²⁷
- Other successful national initiatives for specific payment scenarios, such as e-commerce, mobile and P2P payments, cannot compete with global players on a pan-European scale. Moreover, big tech firms entering the payments market creates further risks, as they could leverage their dominant positions in neighbouring markets and their closed ecosystems.

7.3 User experience

Digital euro services would be easily and equally accessible to all via PSP apps and via a new digital euro app.

The Eurosystem is prioritising several key areas of the user experience in the design of a digital euro. This includes defining user journeys that are attractive to citizens and merchants as users, as well as preparing the associated technical requirements. By addressing these fundamental elements comprehensively, the project aims to create a user-centric digital euro ecosystem that is intuitive, secure, and accessible to all.

The draft legislation envisages that people would have a choice between two ways in which to access and use digital euro services, to strengthen resilience and ensure freedom of choice for consumers. One would be to keep using existing apps from their own PSPs (such as their bank)²⁸, where they could also access additional services – depending on what is developed and offered by the PSP in question. The other would be to use a digital euro app provided by the Eurosystem to easily access basic digital euro services. The digital app would not impinge on the relationship between PSPs and their customers: it would merely provide a uniform point of entry allowing users to interact with their PSP via a smartphone.²⁹ The app would ensure a baseline user experience standard at all times, ensuring that everybody could immediately recognise the digital euro, just as everybody can recognise euro banknotes today.

The ECB has conducted additional technical work on a digital euro app to make it inclusive and accessible to all. The app would offer basic digital euro services, leveraging existing, to the extent possible, application programming interfaces (APIs) and a software development kit (SDK) provided by the ECB wherever feasible to minimise app development and implementation costs. This

²⁷ According to a recent study by the European Commission, the average net merchant service charges applied by card schemes in the EU almost doubled between 2018 and 2022 (from 0.27% to 0.44%). See European Commission, [Study on new developments in card-based payment markets, including as regards relevant aspects of the application of the Interchange Fee Regulation - Final Report](#), February 2024.

²⁸ This could be a PSP app (used by a single PSP) or a payment solution app (used by multiple PSPs collectively).

²⁹ To ensure that the digital euro app would be accessible to all users, the draft legislation requires PSPs to support payments via the digital euro app. Otherwise, users of the digital euro app would be restricted to PSPs that choose to support it, meaning it would not be fully inclusive as envisaged. Moreover, the digital euro app cannot serve as an additional resilience measure if users can only rely on it if the PSP decides to support it.

would also be advantageous to smaller PSPs that lack the resources to develop their own front-end solutions to distribute digital euro services.

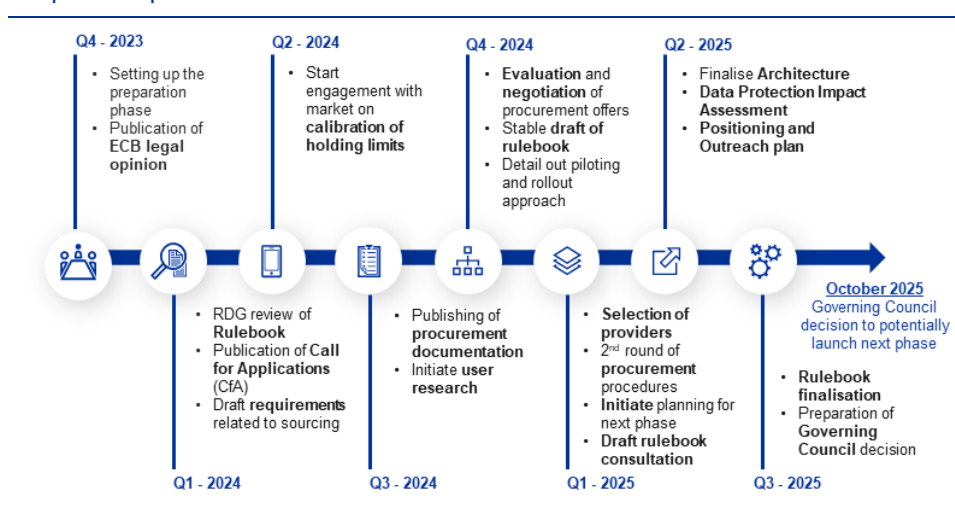
Promoting digital financial inclusion is a key principle underlying the concept of a digital euro app. This is particularly important given the envisaged legal tender status of a digital euro and the associated measures to ensure its accessibility and use. A digital euro app would ensure that the basic functionalities of a digital euro are available to everyone, with features supporting digital inclusion and accessibility for people with limited digital skills or financial resources, people with disabilities and the elderly, also in line with the European Accessibility Act.³⁰ For instance, the app would be made available in all official languages of the EU and would support voice control and recognition.

8

Next steps

Over the coming months, technical work will continue according to the timeline set for the preparation phase. This includes the invitation for external providers to tender on digital euro components, and the preparations for Eurosystem-provided components. The offers received in the procurement process will be negotiated in the subsequent months before making a final selection. In parallel, the newly launched RDG workstreams will provide input on the next draft version of the rulebook, which will be delivered by the end of the year. Finally, the ECB's continued progress with the technical preparations for a digital euro will help to better inform the legislative process.

Figure 4
Preparation phase timeline



The ECB will continue actively engaging with public and private stakeholders and with society at large to report on its progress. At the start of the preparation

³⁰ Directive (EU) 2019/882 of the European Parliament and of the Council of 17 April 2019 on the accessibility requirements for products and services (OJ L 151, 7.6.2019, p. 70).

phase, these activities primarily took the form of bilateral engagement with market stakeholders, including associations of consumers, merchants and payment institutions. In spring the ECB resumed its established market engagement through the ERPB technical sessions on digital euro. It also collaborates and shares learnings with various international central banks (e.g. the Federal Reserve System, the Bank of England, the Reserve Bank of India, Sveriges Riksbank) regarding central bank digital currencies (CBDCs). These engagements will be continued in the coming months, including via further regular ERPB technical sessions. Moreover, the ECB remains committed to continuing the practice of regular exchanges on the digital euro in the context of the Eurogroup meetings and European Parliament hearings.

The ECB will also continue to engage with the general public. Public communication activities are crucial to ensuring potential users can always rely on correct information about a digital euro, its importance and the benefits it could bring to the European payment landscape and their daily lives. User research will be carried out in parallel among consumers and merchants across the euro area to fine-tune our knowledge of potential digital euro users and their views on specific features, and to make sure that a digital euro would be easy to use.

The next progress report on the preparation phase will be published in autumn 2024, one year after it began. The ECB's Governing Council will only decide whether to move to the next stage of preparations at the end of the preparation phase. A possible decision by the Governing Council to issue a digital euro can only be taken after the legislative process has been completed.

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For specific terminology please refer to the [ECB glossary](#) (available in English only).

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